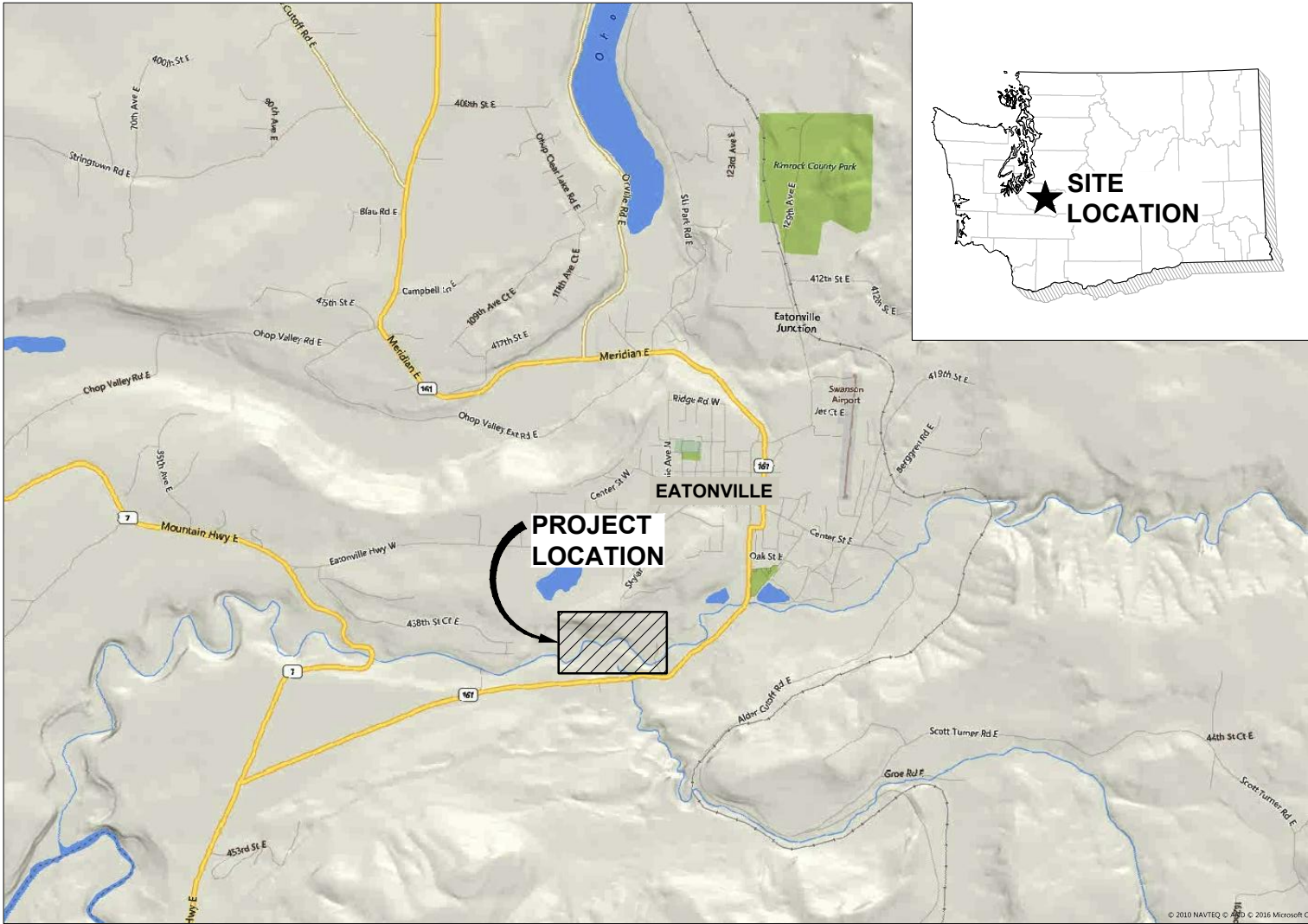


SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP (SPSSEG)

EATONVILLE, WASHINGTON



VICINITY MAP
SCALE: 1"=2000'

OWNER:

SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP
6700 MARTIN WAY E #112
OLYMPIA, WA 98516
PHONE:
CONTACT: BRIAN COMBS

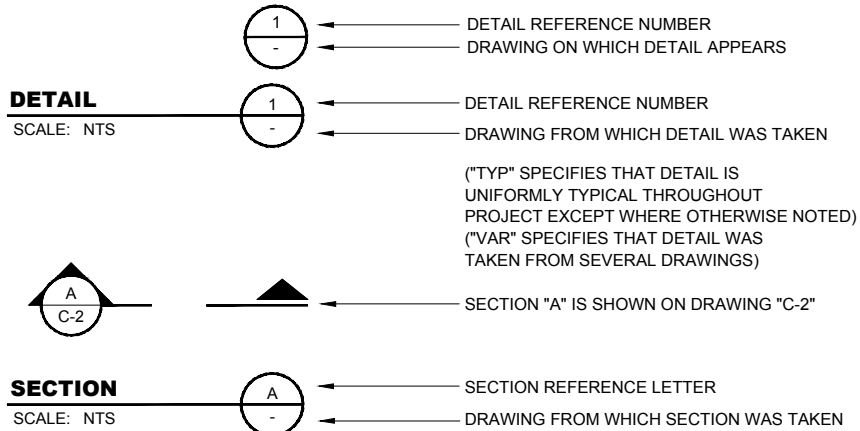
PROJECT PARTNERS:

NISQUALLY INDIAN TRIBE
NISQUALLY LAND TRUST
CITY OF EATONVILLE

ENGINEER:

HERRERA ENVIRONMENTAL CONSULTANTS
2200 SIXTH AVENUE
SUITE 1100
SEATTLE, WA 98121
PHONE: (206) 441-9080
CONTACT: BRIAN SCOTT

SHEET INDEX		
SHEET NO.	DRAWING NO.	DESCRIPTION
1	G-1	VICINITY MAP AND SHEET INDEX
2	G-2	GENERAL NOTES AND LEGEND
3	C-1	EXISTING CONDITIONS
4	C-2	SITE ACCESS AND STAGING AREA PLAN
5	C-3	SITE CONSTRUCTION PLAN
6	C-4	APEX ELJ PLAN AND SECTION
7	C-5	APEX ELJ LAYERING PLAN
8	C-6	LEFT BANK ELJ PLAN AND SECTIONS
9	C-7	LEFT BANK ELJ LAYERING PLAN
10	C-8	RIGHT BANK ELJ PLAN AND SECTIONS
11	C-9	RIGHT BANK ELJ LAYERING PLAN
12	C-10	FLOODPLAIN DETAILS
13	C-11	CHANNEL ALIGNMENTS AND PROFILES
14	C-12	CONTROL POINT TABLES
15	C-13	WATER MANAGEMENT NOTES AND WORK AREA ISOLATION
16	C-14	TESC DETAILS
17	C-15	WATER CROSSING DETAILS



DETAIL AND SECTION REFERENCING

PRELIMINARY DESIGN - NOT FOR CONSTRUCTION				
No.	REVISION	BY	APP'D	DATE

ONE INCH
AT FULL SIZE, IF NOT ONE
INCH SCALE ACCORDINGLY



Know what's **below**.
Call before you dig.



DESIGNED:	DRAWN:
B. SCOTT	E. MARSHALL
DESIGNED:	DRAWN:
I. MOSTRENKO	-
DESIGNED:	CHECKED:
-	I. MOSTRENKO
SCALE:	APPROVED:
AS NOTED	M. EWBANK

MASHEL RIVER
REACH 7 RESTORATION PROJECT
SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP

VICINITY MAP AND SHEET INDEX

DATE: AUGUST 2016

PROJECT NO: 15-06082-000

DRAWING NO: G-1

SHEET NO: 1 OF 16

GENERAL CONSTRUCTION NOTES:

1.

THE WORK INCLUDES ESTABLISHING AND MAINTAINING ACCESS TO WORK AREAS; CONSTRUCTING ENGINEERED LOGJAM (ELJ) STRUCTURES, SIDE CHANNELS, A FLOOD CONTAINMENT BERM, AND FLOODPLAIN ROUGHENING; SITE RESTORATION; AND ALL ASSOCIATED WATER MANAGEMENT AND TEMPORARY EROSION AND SEDIMENT CONTROL(TESC) WORK AS DESCRIBED IN THESE PLANS AND IN THE PROJECT SPECIFICATIONS AND AS NEEDED TO COMPLETE CONSTRUCTION.
2.

ENGINEER IS DEFINED AS THE OWNER'S ENGINEER. SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP IS DEFINED AS THE OWNER.
3.

PRIOR TO INITIATING CONSTRUCTION ACTIVITIES THE CONTRACTOR SHALL STAKE FOR APPROVAL BY THE ENGINEER THE LOCATIONS OF EACH ELJ STRUCTURE INCLUDING LENGTHS, WIDTHS, ORIENTATION AND ELEVATIONS, TEMPORARY CONSTRUCTION ACCESS PATHS, TEMPORARY WATER CROSSINGS, TEMPORARY BRIDGE LOCATIONS, TEMPORARY FLOW DIVERSION MEASURES, AND ALL GRADING/EXCAVATION EXTENTS.
4.

THE CONTRACTOR SHALL STAKE CLEARING LIMITS FOR APPROVAL BY THE ENGINEER AT LEAST 5 WORKING DAYS PRIOR TO COMMENCING CLEARING ACTIVITIES. CLEARING LIMITS FOR CONSTRUCTION SHALL BE LIMITED TO THE AREA REQUIRED FOR SAFE EQUIPMENT OPERATION AND TO MINIMIZE THE AREA OF DISTURBANCE. CLEARING LIMITS SHALL NOT BE EXPANDED UNLESS APPROVED BY THE ENGINEER.
5.

TREES AND BRUSH NOT SHOWN ON THE DRAWINGS WILL BE ENCOUNTERED DURING CONSTRUCTION ACTIVITIES. THE ENGINEER SHALL IDENTIFY AND FLAG ALL TREES TO BE PROTECTED FROM DAMAGE PRIOR TO CONSTRUCTION. FOLLOWING CLEARING OF ALLOWED VEGETATION, THE CONTRACTOR SHALL STOCKPILE ALL TREES AND BRUSH IDENTIFIED BY THE ENGINEER, PRIOR TO AND DURING CONSTRUCTION ACTIVITIES, FOR USE AS RACKING AND SLASH MATERIALS IN THE ELJ STRUCTURES, FOR USE IN AREAS AS SHOWN ON THE DRAWINGS, AND AS DESIGNATED BY THE ENGINEER TO CREATE ROUGH FINISHED GRADED SURFACES. CERTAIN VEGETATION MAY BE FLAGGED BY THE ENGINEER OR THE OWNER FOR SALVAGE, AND CARE SHOULD BE TAKEN TO PROTECT THOSE PLANTS FROM DEHYDRATION.
6.

ALTERATION OR DISTURBANCE OF THE CHANNEL, FLOODPLAIN, AND ANY BANK AND FLOODPLAIN VEGETATION SHALL BE MINIMIZED TO THAT NECESSARY TO CONSTRUCT THE PROJECT. THE CONTRACTOR SHALL KEEP DISTURBED AREAS WITHIN THE PROJECT CONSTRUCTION LIMITS SHOWN ON THE DRAWINGS, AND SHALL NOT EXTEND THESE LIMITS UNLESS APPROVED BY THE ENGINEER.
7.

THE CONTRACTOR SHALL PROVIDE 24 HOURS ADVANCE NOTICE TO THE OWNER OR ENGINEER PRIOR TO ANY REQUIRED INSPECTION.
8.

CONSTRUCTION MATERIAL AND EQUIPMENT STAGING AREAS SHALL BE LOCATED AS SHOWN ON THE DRAWINGS. CONSTRUCTION MATERIALS AND EQUIPMENT SHALL NOT BE STORED OUTSIDE OF IDENTIFIED STAGING AREAS, UNLESS APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL PROTECT ALL CONSTRUCTION MATERIALS AND EQUIPMENT FROM DAMAGE AT ALL TIMES.
9.

NO EQUIPMENT SHALL BE STORED OVERNIGHT BELOW THE ORDINARY HIGH WATER (OHW) LINE.
10.

EQUIPMENT USED FOR THIS PROJECT SHALL BE FREE OF EXTERNAL PETROLEUM-BASED PRODUCTS WHILE WORKING NEAR ANY SURFACE WATER OR WETLANDS. ACCUMULATION OF SOILS OR DEBRIS SHALL BE REMOVED FROM THE DRIVE MECHANISMS (WHEELS, TRACKS, TIRES, ETC.) AND UNDERCARRIAGE OF EQUIPMENT PRIOR TO ITS WORKING BELOW THE OHW LINE.
11.

ALL EQUIPMENT OPERATING IN AREAS OTHER THAN EXISTING UNIMPROVED ACCESS ROADS SHALL USE ONLY BIODEGRADABLE, VEGETABLE BASED HYDRAULIC FLUIDS OR APPROVED OTHER.
12.

EQUIPMENT SHALL BE CHECKED AT THE BEGINNING OF EACH WORK SHIFT FOR LEAKS, AND ANY NECESSARY REPAIRS SHALL BE COMPLETED PRIOR TO COMMENCING WORK ACTIVITIES.
13.

THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT NO PETROLEUM PRODUCTS, HYDRAULIC FLUID, SEDIMENTS, SEDIMENT-LADEN WATER, CHEMICALS, OR ANY OTHER TOXIC OR DELETERIOUS MATERIALS ARE ALLOWED TO ENTER OR LEACH INTO THE RIVER, WETLANDS OR THE PROJECT SITE FROM EQUIPMENT OR SUPPLIES USED DURING CONSTRUCTION.
14.

CONTRACTOR SHALL LIMIT MACHINERY MOVEMENT TO THE PROJECT CONSTRUCTION LIMITS DEFINED ON THE DRAWINGS OR IDENTIFIED AS ACCEPTABLE BY THE ENGINEER.
15.

IF AT ANY TIME, AS A RESULT OF PROJECT ACTIVITIES, FISH ARE OBSERVED IN DISTRESS, A FISH KILL OCCURS, OR WATER QUALITY PROBLEMS DEVELOP (INCLUDING EQUIPMENT LEAKS OR SPILLS), OPERATIONS SHALL CEASE AND THE OWNER SHALL BE NOTIFIED IMMEDIATELY BY THE CONTRACTOR. THE WASHINGTON DEPARTMENT OF FISH AND WILDLIFE AND THE WASHINGTON STATE DEPARTMENT OF ECOLOGY SHALL BE CONTACTED IMMEDIATELY BY THE OWNER. WORK SHALL NOT RESUME UNTIL FURTHER APPROVAL BY THE OWNER.
16.

EROSION AND SEDIMENT CONTROL METHODS SHALL BE USED TO PREVENT SILT-LADEN WATER FROM ENTERING THE RIVER. MINIMUM EROSION AND SEDIMENT CONTROL METHODS ARE SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL SUBMIT FOR APPROVAL BY THE ENGINEER 5 WORKING DAYS PRIOR TO CONSTRUCTION, A TEMPORARY EROSION AND SEDIMENT CONTROL (TESC) PLAN ADDRESSING SITE SPECIFIC EROSION AND SEDIMENT CONTROL TECHNIQUES AND METHODS.
17.

IF HIGH FLOW CONDITIONS THAT MAY CAUSE SILTATION, EROSION OR A DANGEROUS WORK ENVIRONMENT ARE ENCOUNTERED DURING CONSTRUCTION, WORK SHALL STOP UNTIL THE FLOW SUBSIDES.
18.

LOGS SHALL BE DECKED IN THE STAGING AREA SHOWN ON THE PLANS FOR INSPECTION BY THE ENGINEER AND ORGANIZED BY LOG TYPE, DIAMETER AND LENGTH. LOG TYPE IDENTIFICATION SHALL BE PAINTED ON ALL LOGS IN A PLACE VISIBLE FOR INSPECTION PRIOR TO PLACEMENT WITH LEAD-FREE, BLAZE-ORANGE SURVEY MARKING PAINT.
19.

PHOTOGRAPHS DOCUMENTING EXISTING CONDITIONS SHALL BE TAKEN BY THE CONTRACTOR AND SUBMITTED TO THE OWNER 5 WORKING DAYS PRIOR TO THE CONTRACTOR INITIATING WORK.
20.

PROJECT CULTURAL RESOURCES ASSESSMENT SHALL BE COMPLETED BY THE OWNER PRIOR TO CONSTRUCTION.

GENERAL ELJ STRUCTURE CONSTRUCTION SEQUENCING:

1.

STAKE AND CONSTRUCT ACCESS TO WORK AREA, STAKE CLEARING LIMITS, INSTALL TESC MEASURES, THEN COMPLETE NECESSARY CLEARING.
2.

PREPARE STAGING AREAS AT LOCATIONS SHOWN ON PLANS AND IMPORT CONSTRUCTION MATERIAL AS NEEDED FOR CONSTRUCTION TO WORK AREA.
3.

VERIFY LOCATION OF EACH ELJ STRUCTURE AND CLEARLY STAKE ELJ EXCAVATION LIMITS .
4.

IF NEEDED, THE CONTRACTOR SHALL INSTALL RIVER FISH BLOCK NETS AND THE OWNER SHALL CONDUCT FISH REMOVAL (SEINING) PRIOR TO ANY EXCAVATION, GRADING, OR CONSTRUCTION OF INSTREAM STRUCTURES.
5.

IF NEEDED, CONTRACTOR SHALL INSTALL OR CONSTRUCT A FLOW DIVERSION MEASURE TO ISOLATE AND DIVERT FLOW AROUND THE ACTIVE WORK AREA.
6.

DEWATER ISOLATED WORK AREA AS REQUIRED. PUMP WATER FROM ACTIVE WORK AREA TO UPLAND AREA FOR INFILTRATION. ENGINEER OR OWNER SHALL APPROVE OF ALL INFILTRATION AREAS PRIOR TO USE.
7.

INSTALL ELJ STRUCTURES PER THE STRUCTURE DETAILS. NATIVE EXCAVATED ALLUVIUM MATERIAL WILL BE ADDED TO THE STRUCTURES PER THE ENGINEERS DESIGNATION. ALL SUBGRADE ELEVATIONS SHALL BE CONFIRMED AND VERIFIED WITH THE ENGINEER PRIOR TO LOG AND BACKFILL PLACEMENT.
8.

REMOVE ALL MATERIALS FROM STAGING AREA WHEN ELJ STRUCTURE CONSTRUCTION IS COMPLETE.
9.

REMOVE ALL DEWATERING AND FLOW DIVERSION MEASURES.
10.

REMOVE ALL TESC MEASURES.

GENERAL WORK SEQUENCE NOTES:

1.

THIS WORK SEQUENCE IS PRESENTED FOR A GENERAL UNDERSTANDING OF THE PROJECT AND ITS CONSTRAINTS IN RELATION TO CONSTRUCTION AND RELATED SITE ACTIVITY. THE CONTRACTOR IS RESPONSIBLE FOR DEVELOPING A DETAILED WORK SEQUENCE AND PHASING PLAN, WHICH SHALL INCLUDE CONSTRUCTION OF TEMPORARY FACILITIES, CONSTRUCTION OF THE DESIGN FEATURES SHOWN ON THE PLANS, INCORPORATION OF ALL EXISTING AND NEW MATERIALS AS DEPICTED ON THE PLANS AND IN THE SPECIFICATIONS, REMOVAL OF ALL TEMPORARY FACILITIES, AND RESTORATION AND STABILIZATION OF THE SITE.
2.

THE CONTRACTOR SHALL SUBMIT A DETAILED WORK SEQUENCE AND PHASING PLAN FOR APPROVAL BY THE ENGINEER 5 WORKING DAYS PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES. THE PLAN SHALL INCLUDE CLEARING; CONSTRUCTION OF TEMPORARY FACILITIES, ELJ STRUCTURES, FLOW DIVERSIONS, SIDE CHANNELS, FLOODPLAIN FEATURES, SITE STABILIZATION AND REMOVAL OF TEMPORARY FACILITIES.
3.

IN GENERAL, THE WORK SHALL BE SEQUENCED AND PERFORMED IN A MANNER THAT MINIMIZES IMPACTS TO THE RIVER, EXISTING VEGETATION, AQUATIC LIFE, THE WORK SITE, ADJACENT PRIVATE PROPERTY, AND INFRASTRUCTURE.
4.

THE CONTRACTOR MAY DECIDE HOW TO SEQUENCE THE WORK AT EACH SITE. HOWEVER THIS PROJECT WILL BE CONSTRAINED BY AN IN-WATER WORK WINDOW SET FORTH IN THE PROJECT HPA PERMIT AND THE SECTION 404 PERMIT, OUTSIDE OF WHICH NO IN-WATER WORK MAY OCCUR.

ABBREVIATIONS:

APPROX	APPROXIMATE
AVG	AVERAGE
CFS	CUBIC FEET PER SECOND
CP	CONTROL POINT
DET	DETAIL
DIA	DIAMETER
DWG	DRAWING
E	EAST
EL	ELEVATION
ELJ	ENGINEERED LOG JAM
EXIST	EXISTING
FS	FACTOR OF SAFETY
FT	FEET
IE	INVERT ELEVATION
IN	INCHES
MAX	MAXIMUM
MIN	MINIMUM
N	NORTH
NO.	NUMBER
NTS	NOT TO SCALE
O.C.	ON CENTER
OHWM	ORDINARY HIGH WATER MARK
S	SOUTH
TESC	TEMPORARY EROSION AND SEDIMENT CONTROL
TYP	TYPICAL
W	WEST
WSE	WATER SURFACE ELEVATION

LEGEND:

PLAN VIEW SHEETS

NOTE: HATCH SCALE IN LEGEND WILL VARY FROM HATCH SCALE ON PLAN SHEETS BASED ON DRAWING SCALE.

	PARCEL LINE		APEX ELJ
	EXISTING CONTOURS (2' INTERVAL)		LEFT BANK ELJ
	ORDINARY HIGH WATER		RIGHT BANK ELJ
	PROJECT LIMITS		ELJ LABEL
	EXISTING SIDE CHANNELS		ELJ NUMBER
	APPROX WETTED CHANNEL LOW FLOW EXTENTS FOR CONSTRUCTION		ELJ DESIGNATOR (APEX, LEFT BANK, RIGHT BANK)
	EXPOSED SEDIMENTARY BEDROCK		
	EXISTING RIPRAP		
	PROPOSED FLOODPLAIN BERM		
	PROPOSED SIDE CHANNEL EXCAVATION (CENTERLINE AND TOE OF BANKS)		
	PROPOSED FLOODPLAIN ROUGHENING		
	PROPOSED REGRADING		
	TEMPORARY BRIDGE		
	TEMPORARY ACCESS PATH		
	CONSTRUCTION STAGING AREA		

DETAIL SHEETS

NOTE: HATCH SCALE IN LEGEND WILL VARY FROM HATCH SCALE ON PLAN SHEETS BASED ON DRAWING SCALE.

	EXCAVATION LIMITS		LOG WITH ROOTWAD
	EXISTING SUBGRADE		LOG
	TOPSOIL TYPE A		PILE
	NATIVE ALLUVIUM FILL		LOG WITH ROOTWAD (SECTION VIEW)
	SALVAGED OR IMPORTED RIPRAP		RACKING MATERIAL
	SLASH (OR SLASH AND RACKING)		STRUCTURE CONTROL POINT
	EXISTING SEDIMENTARY BEDROCK		LOG TYPE ID (LOG TYPE R1)
	CONSTRUCTION KEY NOTE (3)		LOG SEQUENCING ORDER

PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

No.	REVISION	BY	APP'D	DATE

ONE INCH
↑
AT FULL SIZE, IF NOT ONE
INCH SCALE ACCORDINGLY
↓



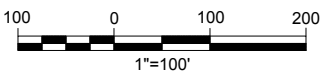
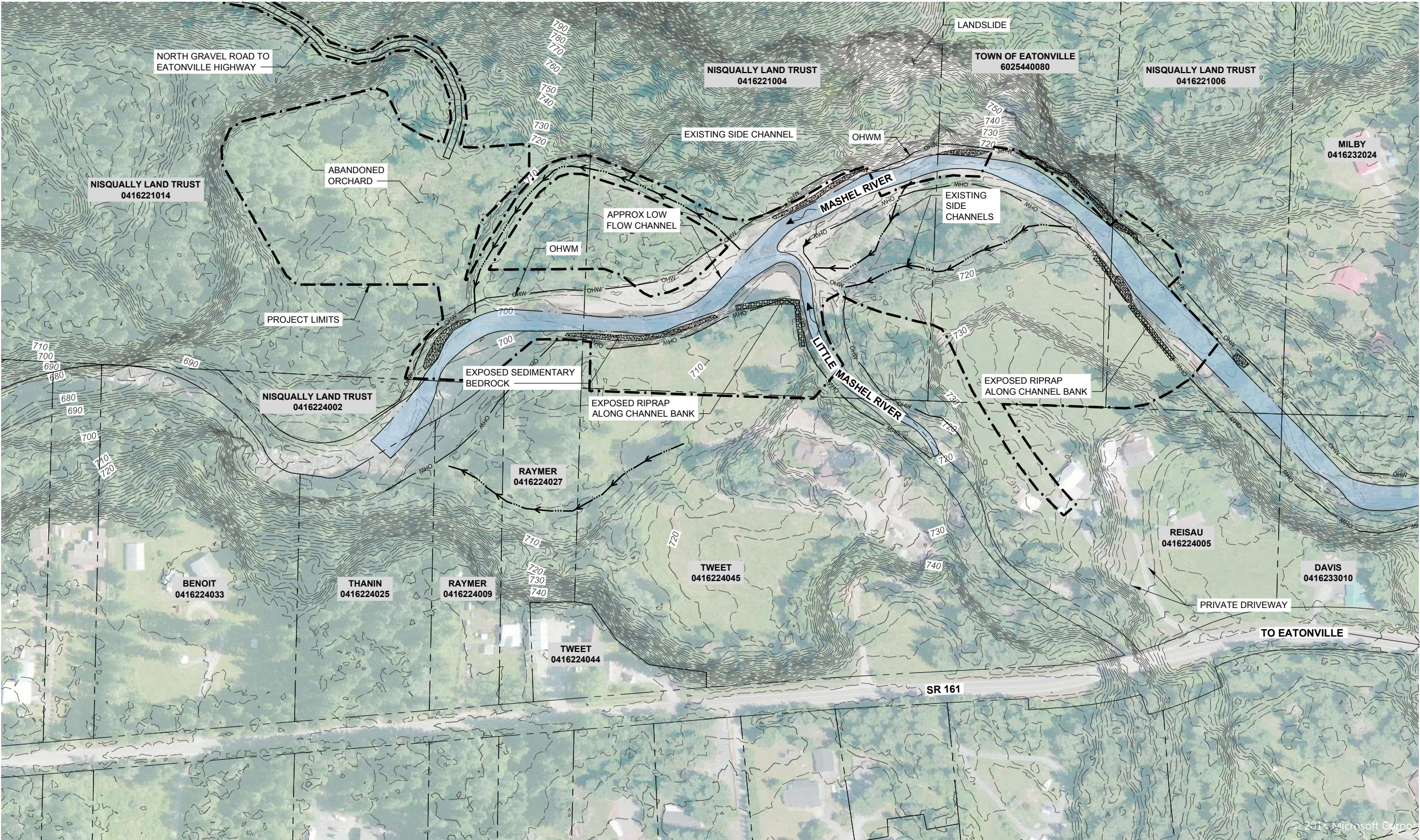
DESIGNED:	DRAWN:
B. SCOTT	E. MARSHALL
DESIGNED:	DRAWN:
I. MOSTRENKO	-
DESIGNED:	CHECKED:
-	I. MOSTRENKO
SCALE:	APPROVED:
AS NOTED	M. EWBANK

MASHEL RIVER REACH 7 RESTORATION PROJECT SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP
GENERAL NOTES AND LEGEND

DATE:	AUGUST 2016
PROJECT NO:	15-06082-000
DRAWING NO:	G-2
SHEET NO:	2 OF 16

ORIGINATED BY: / DATE: /
CHECKED BY: / DATE: /
BACK-CHECKED BY: / DATE: /
CORRECTED BY: / DATE: /
VERIFIED BY: / DATE: /

C:\p001\201615-06082-000\CAD\DWG\C-1.dwg | 8/19/2016 12:33 PM | Eric Marshall



- NOTES:**
1. THIS DRAWING SHOWS THE EXISTING CONDITIONS AND THE REACH CONSTRUCTION AREAS IN RELATION TO NEARBY ROADWAYS, THE MASHEL RIVER, ACCESS POINTS AND OTHER RELEVANT LANDMARKS.
 2. TOPOGRAPHY AND AERIAL PHOTOGRAPHY SHOWN IS BASED ON A SEPTEMBER 2015 GROUND SURVEY, 2010 LIDAR DATA, AND 2010 AERIAL PHOTOGRAPHY AND DOES NOT REFLECT ACTUAL SITE CONDITIONS FOLLOWING THE DECEMBER 2015 FLOOD.

PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

No.	REVISION	BY	APP'D	DATE

ONE INCH
↑
AT FULL SIZE, IF NOT ONE
INCH SCALE ACCORDINGLY
↓



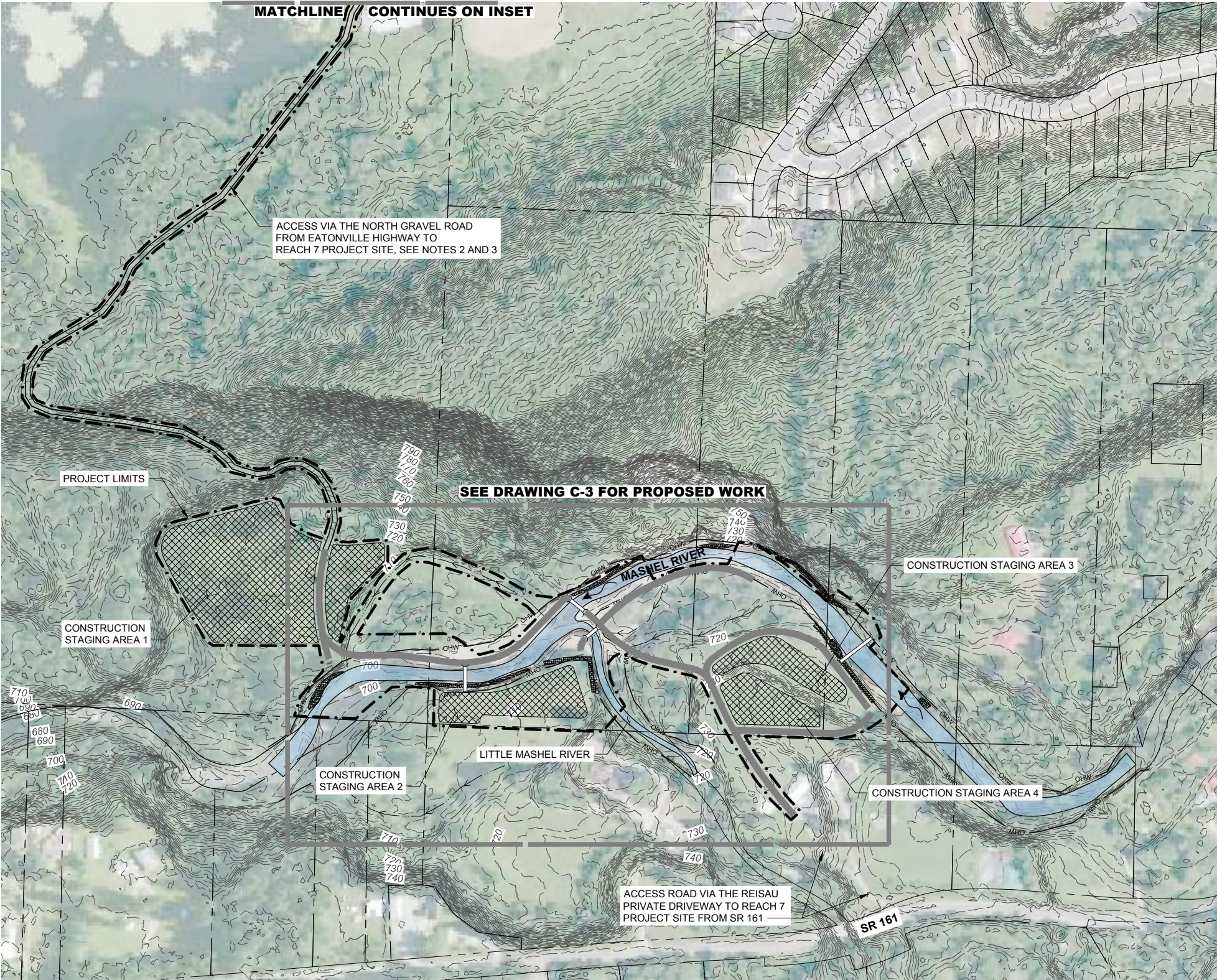
DESIGNED: B. SCOTT	DRAWN: E. MARSHALL
DESIGNED: I. MOSTRENKO	DRAWN: -
DESIGNED: -	CHECKED: I. MOSTRENKO
SCALE: AS NOTED	APPROVED: M. EW BANK

MASHEL RIVER
REACH 7 RESTORATION PROJECT
SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP

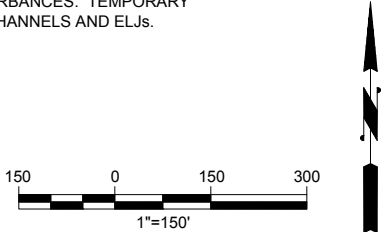
EXISTING CONDITIONS

DATE:	AUGUST 2016	
PROJECT NO:	15-06082-000	
DRAWING NO:	C-1	
SHEET NO:	3	OF 16

ORIGINATED BY: / DATE: /
CHECKED BY: / DATE: /
BACK-CHECKED BY: / DATE: /
C:\p\p\2016\15-06082-000\CADD\DWG\C-2.dwg | 8/19/2016 12:33 PM | Eric Marshall



- NOTES:**
1. THIS DRAWING SHOWS THE ACCESS ROADS TO THE REACH 7 PROJECT SITE, THE PROJECT CONSTRUCTION AREA AND THE CONSTRUCTION STAGING AREAS IN RELATION TO SR 161, ADJACENT PRIVATE PROPERTY, THE MASHEL RIVER AND THE LITTLE MASHEL RIVER.
 2. THE ALTERNATE ACCESS ROAD ALONG THE NORTH GRAVEL ROAD FROM EATONVILLE HIGHWAY LEADING TO CONSTRUCTION STAGING AREA 1 SHALL BE USED IF ACCESS TO THE PROJECT SITE VIA THE PRIVATE DRIVEWAY THROUGH THE REISAU PROPERTY FROM SR 161 IS NOT ALLOWED.
 3. ACCESS VIA THE NORTH GRAVEL ROAD TO THE PROJECT SITE SHALL BE CONFIRMED BY THE SPSEEG PRIOR TO CONSTRUCTION.
 4. PROTECT EXISTING TREES AND SHRUBS WITHIN ALL CONSTRUCTION STAGING AREAS FROM DAMAGE. NO CLEARING OR GRUBBING ALLOWED. RESTORE STAGING AREAS TO PRECONSTRUCTION CONDITION AT THE CONCLUSION OF CONSTRUCTION. FOLLOWING COMPLETION OF CONSTRUCTION PLACE STRAW MULCH AND SEED ALL DISTURBED AREAS WITHIN CONSTRUCTION STAGING AREAS.
 5. TEMPORARY ACCESS PATH ALIGNMENTS SHOWN ARE APPROXIMATE AND SHALL BE ROUTED TO MINIMIZE DISTURBANCE TO EXISTING VEGETATION. WHERE GRADING AND CLEARING IS NECESSARY CONTRACTOR SHALL LIMIT ACTIVITIES TO MINIMIZE DISTURBANCES. TEMPORARY ACCESS ROADS SHALL BE USED ONLY FOR CONSTRUCTION OF NEW CHANNELS AND ELJs.



PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

No.	REVISION	BY	APP'D	DATE

ONE INCH
↑
AT FULL SIZE IF NOT ONE
INCH SCALE ACCORDINGLY
↓



DESIGNED: B. SCOTT	DRAWN: E. MARSHALL
DESIGNED: I. MOSTRENKO	DRAWN: -
DESIGNED: -	CHECKED: I. MOSTRENKO
SCALE: AS NOTED	APPROVED: M. EWBank

MASHEL RIVER
REACH 7 RESTORATION PROJECT
SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP

SITE ACCESS AND STAGING AREA PLAN

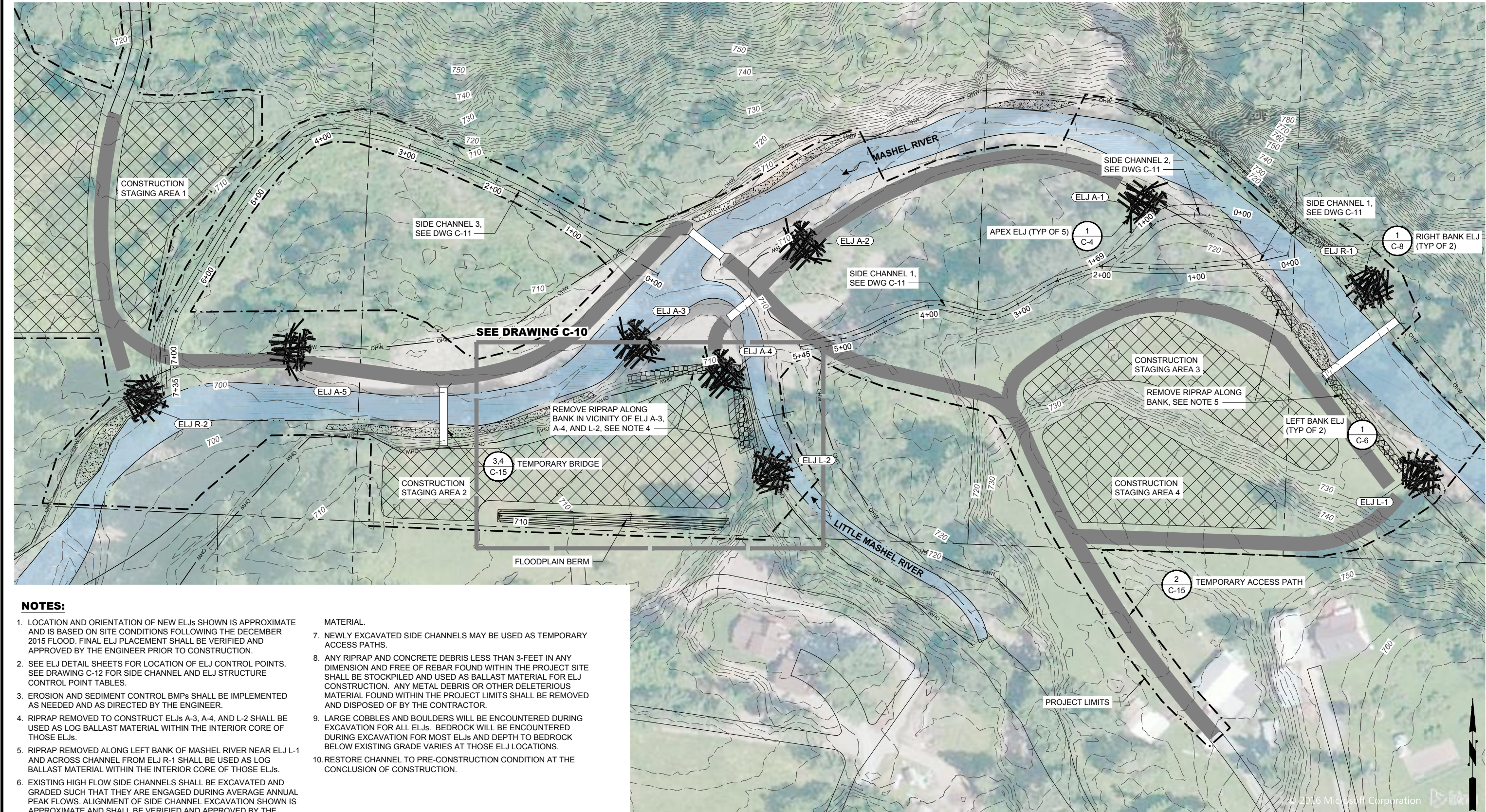
DATE: AUGUST 2016
PROJECT NO: 15-06082-000
DRAWING NO: C-2
SHEET NO: 4 OF 16

ORIGINATED BY: / DATE: /
CHECKED BY: / DATE: /
BACK-CHECKED BY: / DATE: /
CORRECTED BY: / DATE: /
VERIFIED BY: / DATE: /

C:\p\p\12015\15-06082-000\CADD\DWG\C-3.dwg | 8/19/2016 12:34 PM | Eric Marshall

NOTES:

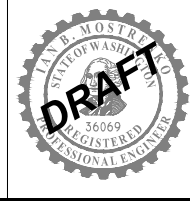
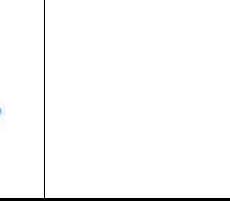
1. LOCATION AND ORIENTATION OF NEW ELJs SHOWN IS APPROXIMATE AND IS BASED ON SITE CONDITIONS FOLLOWING THE DECEMBER 2015 FLOOD. FINAL ELJ PLACEMENT SHALL BE VERIFIED AND APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.
2. SEE ELJ DETAIL SHEETS FOR LOCATION OF ELJ CONTROL POINTS. SEE DRAWING C-12 FOR SIDE CHANNEL AND ELJ STRUCTURE CONTROL POINT TABLES.
3. EROSION AND SEDIMENT CONTROL BMPs SHALL BE IMPLEMENTED AS NEEDED AND AS DIRECTED BY THE ENGINEER.
4. RIPRAP REMOVED TO CONSTRUCT ELJs A-3, A-4, AND L-2 SHALL BE USED AS LOG BALLAST MATERIAL WITHIN THE INTERIOR CORE OF THOSE ELJs.
5. RIPRAP REMOVED ALONG LEFT BANK OF MASHEL RIVER NEAR ELJ L-1 AND ACROSS CHANNEL FROM ELJ R-1 SHALL BE USED AS LOG BALLAST MATERIAL WITHIN THE INTERIOR CORE OF THOSE ELJs.
6. EXISTING HIGH FLOW SIDE CHANNELS SHALL BE EXCAVATED AND GRADED SUCH THAT THEY ARE ENGAGED DURING AVERAGE ANNUAL PEAK FLOWS. ALIGNMENT OF SIDE CHANNEL EXCAVATION SHOWN IS APPROXIMATE AND SHALL BE VERIFIED AND APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION. SEE DRAWING C-11 FOR TYPICAL CROSS-SECTION OF SIDE CHANNEL EXCAVATION. TEMPORARILY STOCKPILE SPOILS FOR USE AS ELJ BACKFILL MATERIAL.
7. NEWLY EXCAVATED SIDE CHANNELS MAY BE USED AS TEMPORARY ACCESS PATHS.
8. ANY RIPRAP AND CONCRETE DEBRIS LESS THAN 3-FEET IN ANY DIMENSION AND FREE OF REBAR FOUND WITHIN THE PROJECT SITE SHALL BE STOCKPILED AND USED AS BALLAST MATERIAL FOR ELJ CONSTRUCTION. ANY METAL DEBRIS OR OTHER DELETERIOUS MATERIAL FOUND WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR.
9. LARGE COBBLES AND BOULDERS WILL BE ENCOUNTERED DURING EXCAVATION FOR ALL ELJs. BEDROCK WILL BE ENCOUNTERED DURING EXCAVATION FOR MOST ELJs AND DEPTH TO BEDROCK BELOW EXISTING GRADE VARIES AT THOSE ELJ LOCATIONS.
10. RESTORE CHANNEL TO PRE-CONSTRUCTION CONDITION AT THE CONCLUSION OF CONSTRUCTION.



PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

No.	REVISION	BY	APP'D	DATE

ONE INCH
↑
AT FULL SIZE IF NOT ONE
INCH SCALE ACCORDINGLY



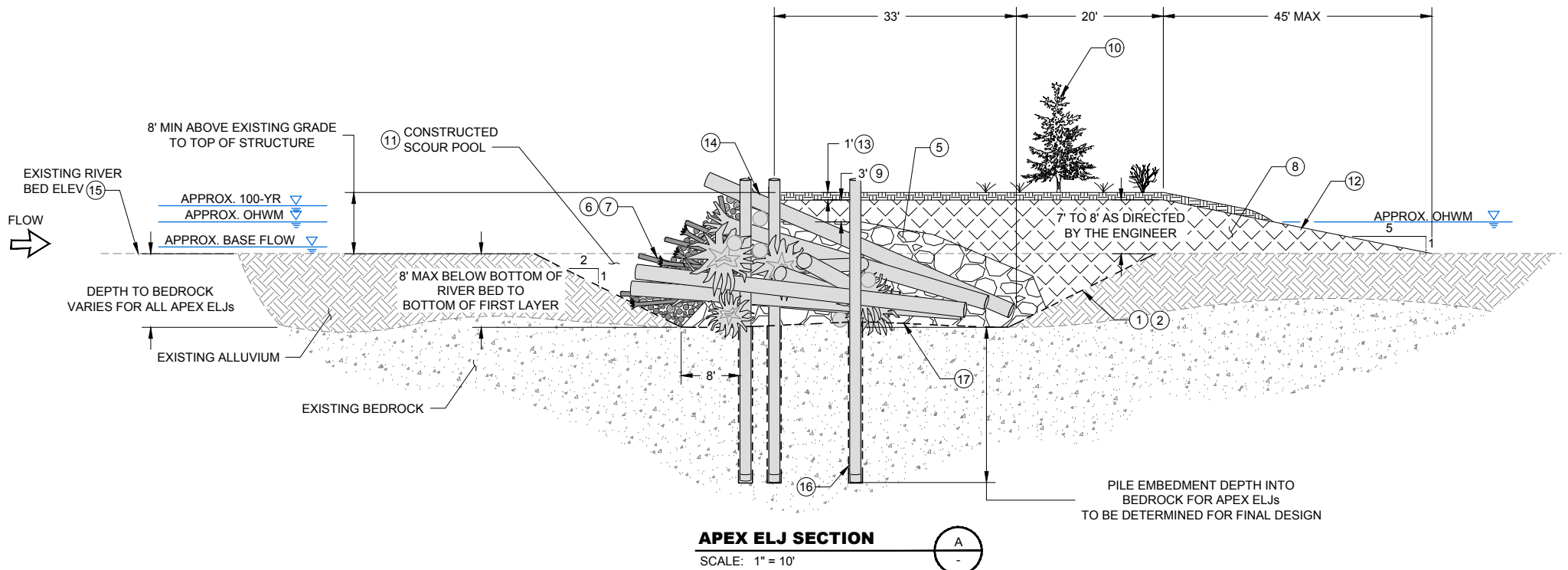
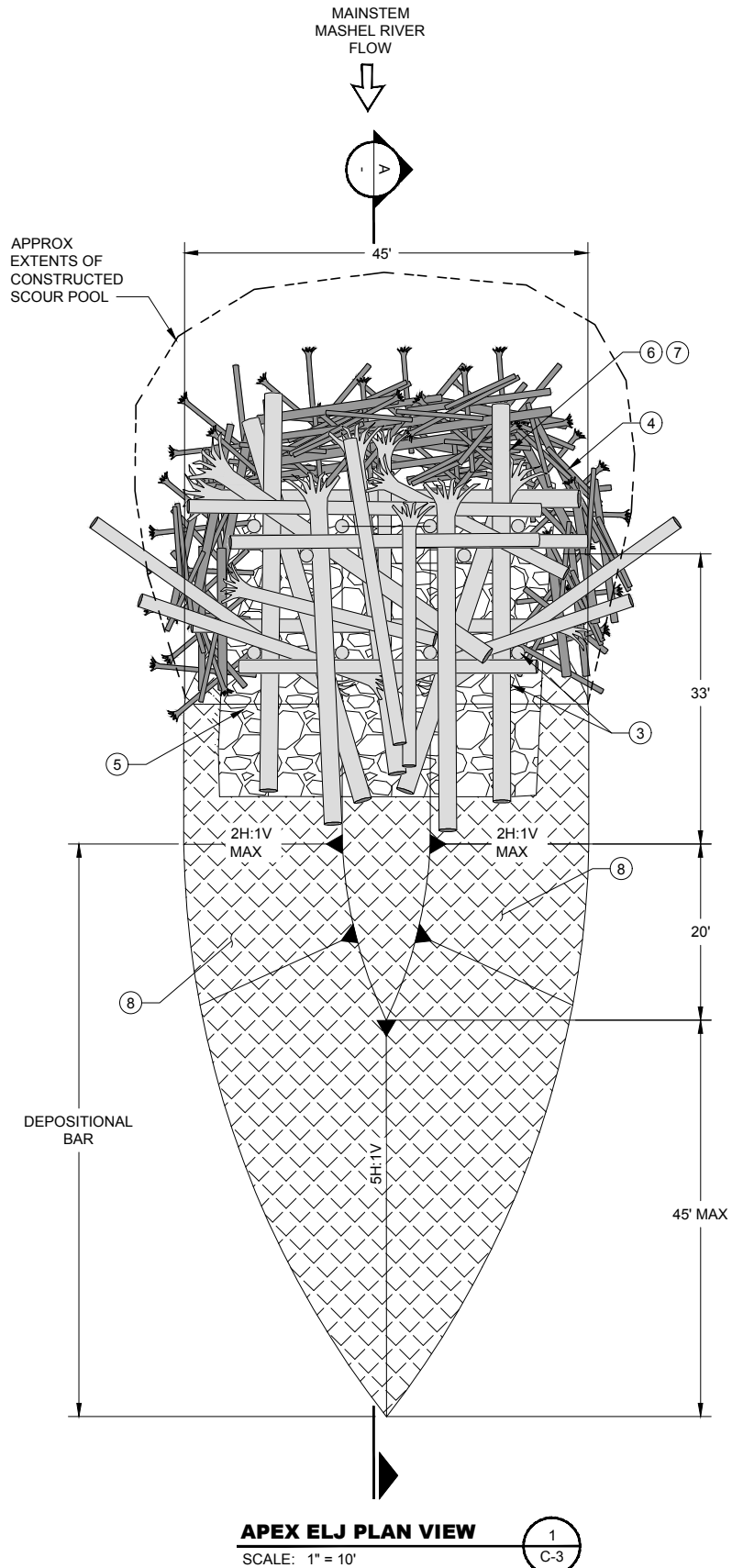
DESIGNED: B. SCOTT	DRAWN: E. MARSHALL
DESIGNED: I. MOSTRENKO	DRAWN: -
DESIGNED: -	CHECKED: I. MOSTRENKO
SCALE: AS NOTED	APPROVED: M. EWBANK

MASHEL RIVER
REACH 7 RESTORATION PROJECT
SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP

SITE CONSTRUCTION PLAN

DATE: AUGUST 2016
PROJECT NO: 15-06082-000
DRAWING NO: C-3
SHEET NO: 5 OF 16

ORIGINATED BY: / DATE: /
CHECKED BY: / DATE: /
BACK-CHECKED BY: / DATE: /
C:\pwworking\2016\15-06082-000\CAD\DWG\C-4.dwg | 8/19/2016 12:34 PM | Eric Marshall



CONSTRUCTION KEY NOTES:

- 1 APPROXIMATE ELJ EXCAVATION LIMITS.
- 2 EXCAVATED SIDE SLOPE AT DOWNSTREAM END OF ELJ VARIES BASED ON CONSTRUCTION ACCESS NEEDS.
- 3 PLACE PILES AND KEY MEMBERS ACCORDING TO ELJ LAYERING PLAN.
- 4 SMALL WOODY DEBRIS AND SLASH EMBEDDED INTO FLANKS OF ELJs IN AND AROUND INTERFACE OF KEY LOGS AND RACKING LOGS PRIOR TO BACKFILLING, EXTENDING FROM BASE OF ELJ TO 3- FEET ABOVE EXISTING GRADE.
- 5 COORDINATE WITH WITH ENGINEER PRIOR TO PLACING SALVAGED AND IMPORTED RIPRAP AND NATIVE ALLUVIUM FOR LOG BALLAST.
- 6 COORDINATE WITH ENGINEER PRIOR TO PLACING RACKING LOGS AND SLASH.
- 7 RACKING LOG SHALL EXTEND THROUGH LOG LAYERS 1, 2, 3, 4 AND 5.
- 8 CONSTRUCT DEPOSITIONAL BAR WITH NATIVE ALLUVIUM THAT IS EXCAVATED FOR SIDE CHANNEL AND ELJ CONSTRUCTION. CONSTRUCT FLANKS OF ELJ AND DEPOSITIONAL BAR WITH NATIVE ALLUVIUM BACKFILL MATERIAL ACCORDING TO THE SLOPE SHOWN ON THESE DETAILS.
- 9 MAINTAIN A MINIMUM DEPTH OF 3- FEET OF NATIVE ALLUVIUM BACKFILL MATERIAL OVER TOP OF INTERNAL LOG BALLAST MATERIAL.
- 10 PLANTING TOP OF ELJ TO BE COMPLETED BY OTHERS.
- 11 DO NOT BACKFILL UPSTREAM OF ELJ. LEAVE AS A POOL.
- 12 ADJUST FINAL GRADE OF DEPOSITIONAL BAR ON DOWNSTREAM SIDE OF ELJ AS NEEDED TO PLACE ALL EXCESS ALLUVIUM.
- 13 12-INCHES OF IMPORTED TOPSOIL AND 4-INCHES OF MULCH TO BE PLACED ABOVE OHWM AS DIRECTED BY ENGINEER.
- 14 PLACE SALVAGED BRUSH ALONG EDGE OF ELJ BETWEEN SOIL AND RACKING LOGS TO PREVENT BLEEDING SOIL FROM THE ELJ.
- 15 CONTRACTOR SHALL DETERMINE EXCAVATION DEPTH AND ELJ HEIGHT BASED ON EXISTING RIVER BED ELEVATION.
- 16 TIMBER PILES SHALL BE DRIVEN OR PLACED INTO VERTICAL DRILLED ROCK SHAFTS THROUGH SEDIMENTARY BEDROCK AND EXISTING ALLUVIUM. TRIM PILES ON THREE SIDES AND FIELD FIT TO SHAFT DIAMETER.
- 17 EXCAVATE TO BEDROCK OR TO DIMENSION SHOWN, WHICH EVER IS ENCOUNTERED FIRST, THEN DRILL AND PLACE PILES AND PLACE KEY LOGS AS SHOWN. PLACE BACKFILL TO DIMENSIONS SHOWN.

PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

No.	REVISION	BY	APP'D	DATE

ONE INCH
AT FULL SIZE IF NOT ONE
INCH SCALE ACCORDINGLY



DESIGNED: B. SCOTT	DRAWN: E. MARSHALL
DESIGNED: I. MOSTRENKO	DRAWN: -
DESIGNED: -	CHECKED: I. MOSTRENKO
SCALE: AS NOTED	APPROVED: M. EW BANK

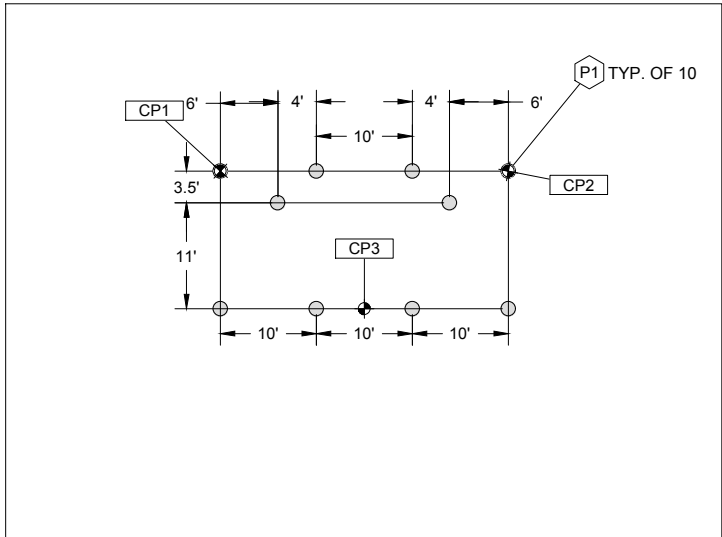
MASHSEL RIVER REACH 7 RESTORATION PROJECT SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP
APEX ELJ PLAN AND SECTION

DATE: AUGUST 2016
PROJECT NO: 15-06082-000
DRAWING NO: C-4
SHEET NO: 6
OF 16

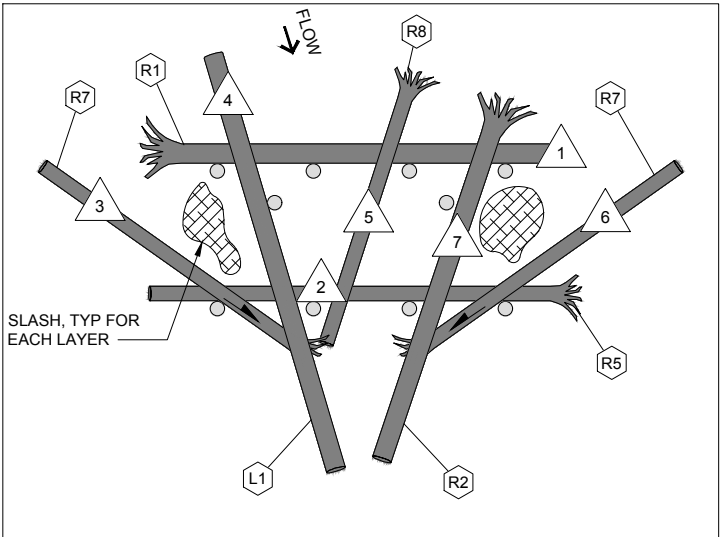
ORIGINATED BY: / DATE: /
CHECKED BY: / DATE: /
BACK-CHECKED BY: / DATE: /

CORRECTED BY: / DATE: /
VERIFIED BY: / DATE: /

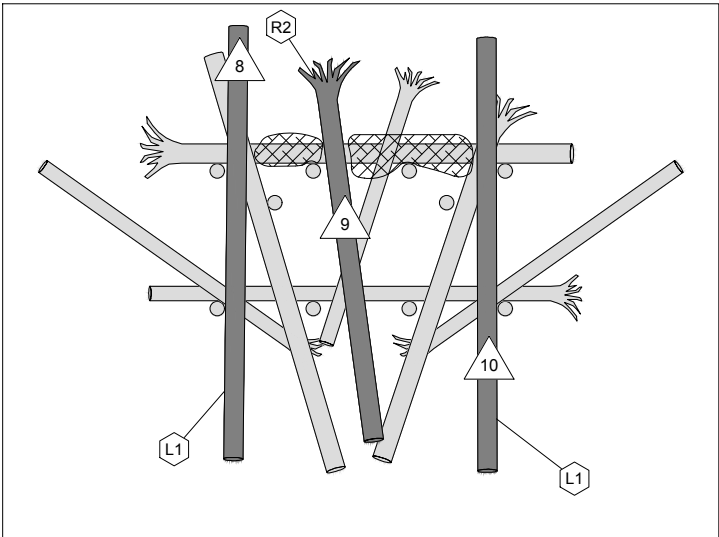
C:\pww\2016\15-06082-000\CAD\DWG\C-5.dwg | 8/19/2016 12:34 PM | Eric Marshall



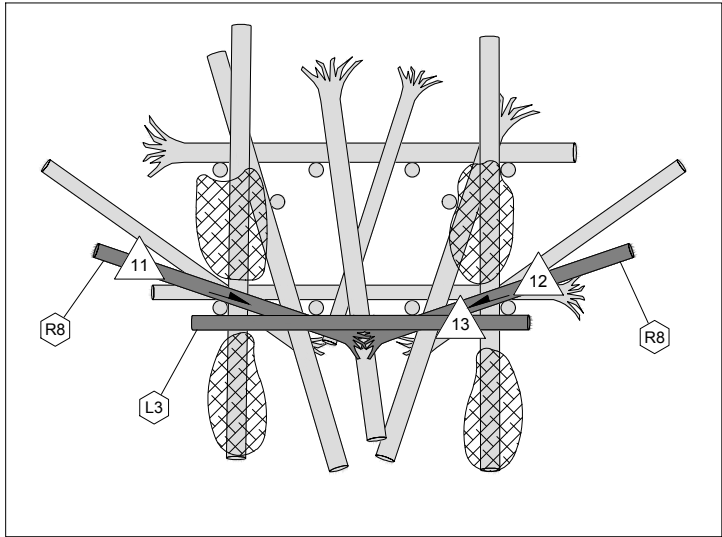
PILE LAYOUT



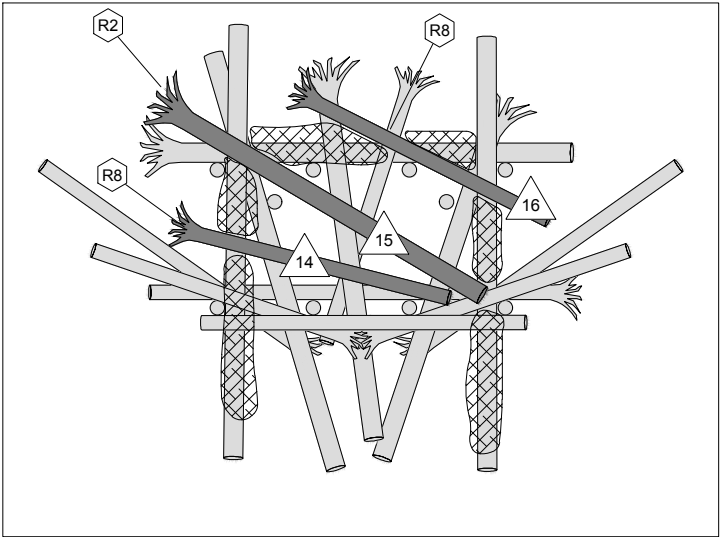
LAYER 1



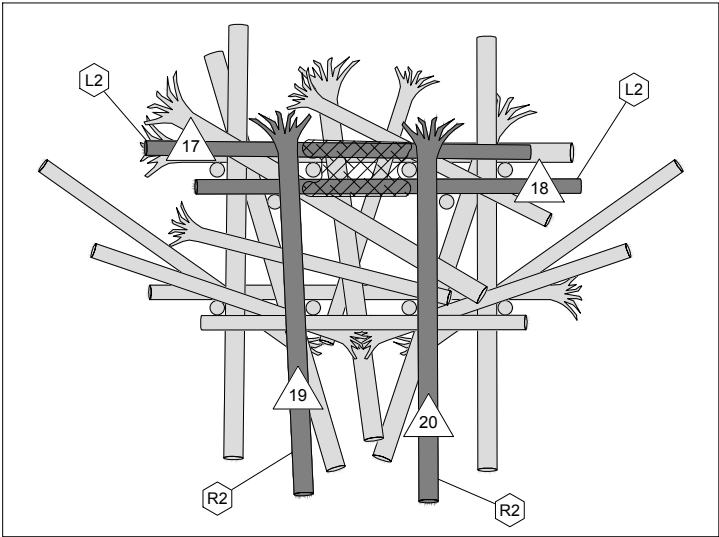
LAYER 2



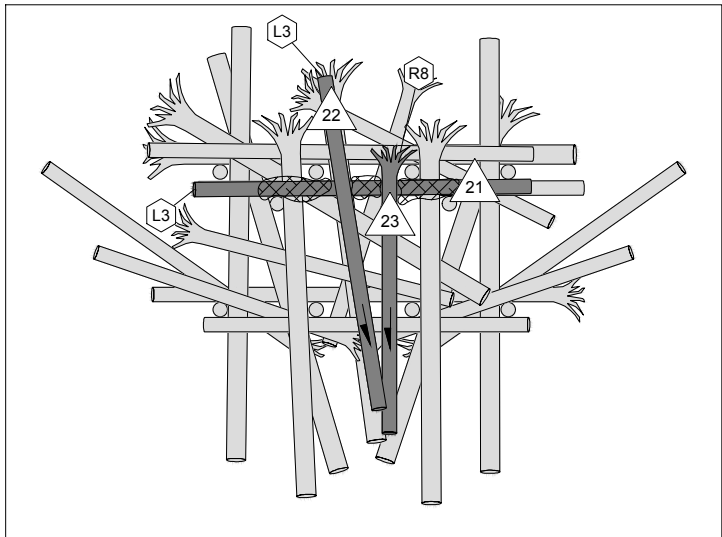
LAYER 3



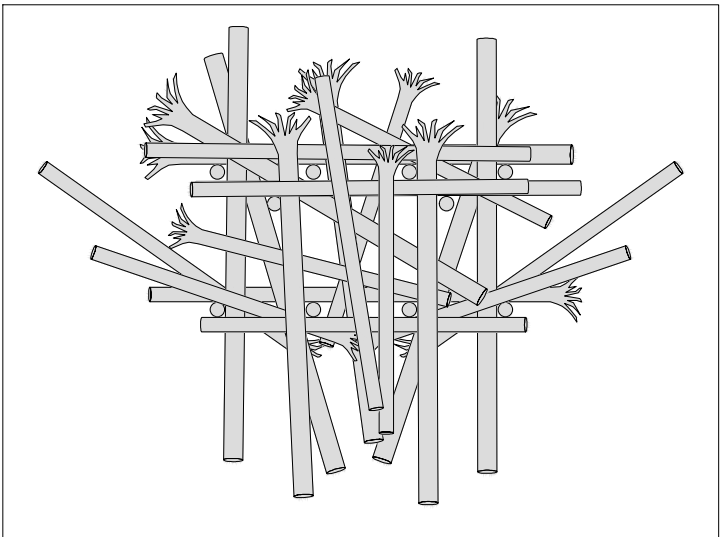
LAYER 4



LAYER 5



LAYER 6



COMPLETE

LOG SCHEDULE - APEX ELJ:				
LOG TYPE	MINIMUM DIAMETER (IN)	LENGTH (FT)	ROOTWAD	TOTAL QTY PER ELJ
P1	18	40	NO	10
R1	24	45	YES	1
R2	24	40	YES	5
R5	18	45	YES	1
R7	18	35	YES	2
R8	18	30	YES	6
L1	24	45	NO	3
L2	18	40	NO	2
L3	18	35	NO	3
RACKING	4-16	15-30		100
SLASH	-	-		70 CY

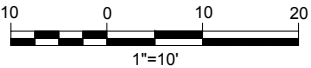
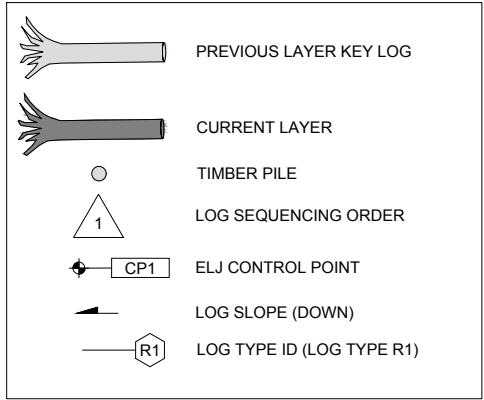
GENERAL NOTES:

1. FINAL ELJ LOCATION AND ORIENTATION SHALL BE FIELD VERIFIED BY THE ENGINEER PRIOR TO THE CONTRACTOR STAKING PILE LOCATIONS.
2. PILE LOCATIONS SHALL BE STAKED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER PRIOR TO PILE INSTALLATION.
3. PILE LOCATIONS ARE SYMMETRICAL ABOUT THE ELJ CONTROL POINT.
4. PILE LOCATIONS SHALL BE BASED ON THE LOCATION OF THE ELJ CONTROL POINT AND SHALL BE WITHIN 6 INCHES OF THE LOCATION SHOWN ON THE DRAWINGS.
5. LOG MATERIALS SHALL BE PLACED AT THE LOCATIONS, ELEVATIONS AND ORIENTATIONS SPECIFIED ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER.
6. TRIM LOGS TO FIT AS REQUIRED.
7. TRIM PILES A MINIMUM OF 18 INCHES AND A MAXIMUM OF 24 INCHES ABOVE FINAL GRADE.
8. EXCAVATION LIMITS VARY DEPENDING ON THE LOCAL SOIL CONDITIONS AND THE CONSTRUCTION TECHNIQUES EMPLOYED.
9. INSTALL LOGS, RACKING LOGS, SLASH, IMPORTED BALLAST MATERIAL AND NATIVE BACKFILL MATERIAL AS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER.
10. SEE DRAWING C-12 FOR ELJ CONTROL POINT COORDINATES.
11. RACKING NOT SHOWN FOR CLARITY. PLACE RACKING ALONG UPSTREAM FACE AND ALONG THE SIDES OF THE ELJ AS SHOWN ON THE DETAIL SHEET. RACKING SHALL BE PLACED PARALLEL TO AND BETWEEN PILES EXTENDING OUT FROM THE ELJ. ALL RACKING SHALL BE PLACED TO CREATE AN INTERLOCKING MATRIX OF LOGS SECURED BETWEEN PILES AND KEY LOGS. PLACE SLASH AT SAME TIME AS RACKING TO FILL VOIDS BETWEEN RACKING.

ELJ CONSTRUCTION SEQUENCE NOTES:

1. INSTALL PILES TO SPECIFIED DEPTH.
2. INSTALL LAYER 1 LOGS, RACKING LOGS, SLASH AND FIRST LIFT OF IMPORTED OF BALLAST MATERIAL.
3. FILL ALL VOIDS IN BALLAST MATERIAL WITH NATIVE BACKFILL MATERIAL.
4. INSTALL LAYER 2 AND LAYER 3 LOGS, RACKING LOGS, SLASH AND SECOND LIFT OF IMPORTED BALLAST MATERIAL.
5. FILL ALL VOIDS IN BALLAST MATERIAL WITH NATIVE BACKFILL MATERIAL.
6. INSTALL LAYER 4 AND LAYER 5 LOGS, RACKING LOGS, SLASH AND THIRD LIFT OF IMPORTED BALLAST MATERIAL.
7. FILL ALL VOIDS IN BALLAST MATERIAL WITH NATIVE BACKFILL MATERIAL.
8. INSTALL LAYER 6 LOGS RACKING LOGS, SLASH AND FOURTH LIFT OF IMPORTED BALLAST MATERIAL.
9. COMPLETELY BACKFILL REMAINDER OF ELJ INTERIOR AND CONSTRUCT DEPOSITIONAL BAR WITH NATIVE BACKFILL MATERIAL TO GRADE AND EXTENTS SHOWN ON ELJ PLAN.
10. PLACE TOPSOIL AND MULCH OVER TOP OF ELJ AS SHOWN ON ELJ PLAN.

LEGEND:



PRELIMINARY DESIGN - NOT FOR CONSTRUCTION				
No.	REVISION	BY	APP'D	DATE



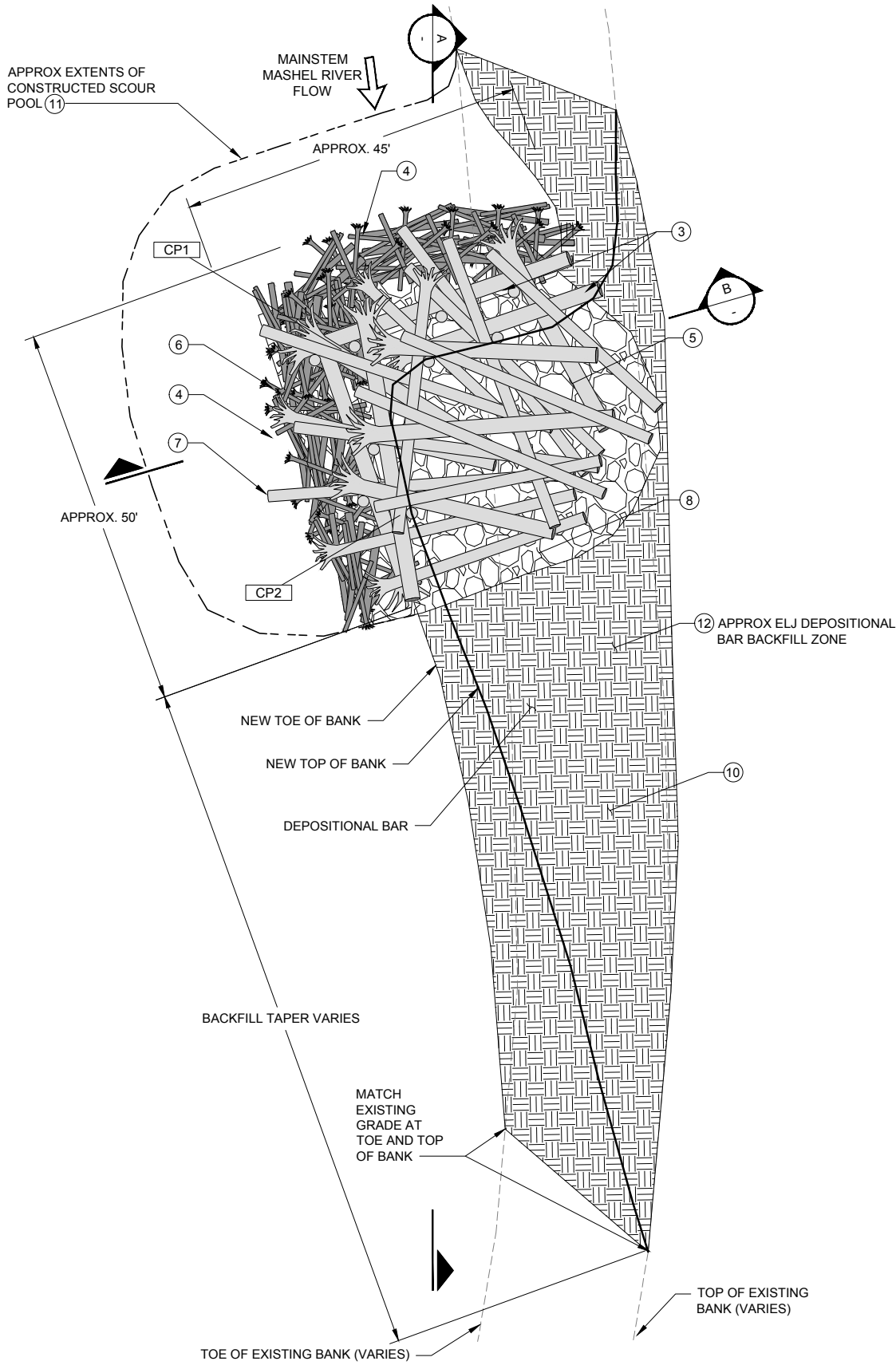
DESIGNED: B. SCOTT	DRAWN: E. MARSHALL
DESIGNED: I. MOSTRENKO	DRAWN: -
DESIGNED: -	CHECKED: I. MOSTRENKO
SCALE: AS NOTED	APPROVED: M. EWBANK

MASHEL RIVER
REACH 7 RESTORATION PROJECT
SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP

APEX ELJ LAYERING PLAN

DATE: AUGUST 2016
PROJECT NO: 15-06082-000
DRAWING NO: C-5
SHEET NO: 7 OF 16

ORIGINATED BY: / DATE: /
CHECKED BY: / DATE: /
BACK-CHECKED BY: / DATE: /
C:\pww\2016\15-06082-000\CADD\DWG\C-6.dwg | 8/19/2016 12:34 PM | Eric Marshall



LEFT BANK ELJ PLAN VIEW
SCALE: 1" = 10'

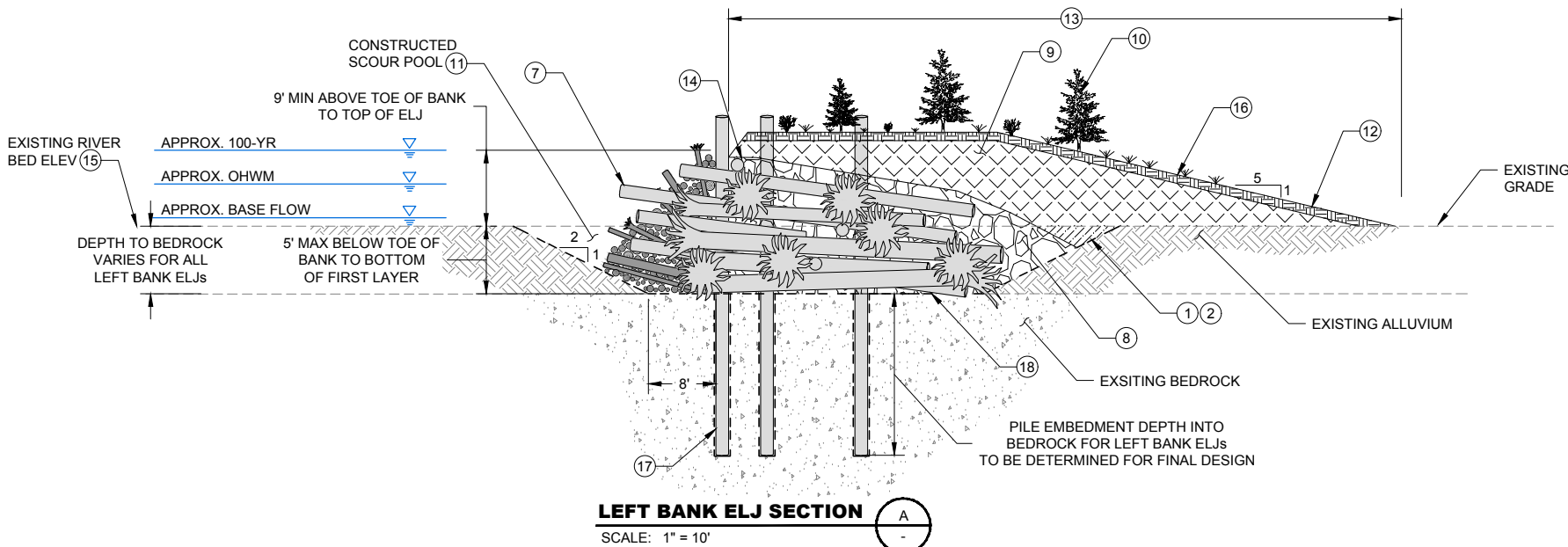
CONSTRUCTION KEY NOTES:

- 1 APPROXIMATE ELJ EXCAVATION LIMITS.
- 2 EXCAVATED SIDE SLOPES VARY BASED ON CONSTRUCTION ACCESS NEEDS.
- 3 PLACE PILES AND KEY MEMBERS ACCORDING TO ELJ LAYERING PLAN.
- 4 SMALL WOODY DEBRIS AND SLASH EMBEDDED INTO FLANKS OF ELJ IN AND AROUND INTERFACE OF KEY LOGS AND RACKING LOGS PRIOR TO BACKFILLING, EXTENDING FROM BASE TO 3-FEET ABOVE EXISTING GRADE.
- 5 COORDINATE WITH ENGINEER PRIOR TO PLACING SALVAGED RIPRAP, ALLUVIUM AND IMPORTED RIPRAP FOR LOG BALLAST.
- 6 COORDINATE WITH ENGINEER PRIOR TO PLACING RACKING LOGS AND SLASH.

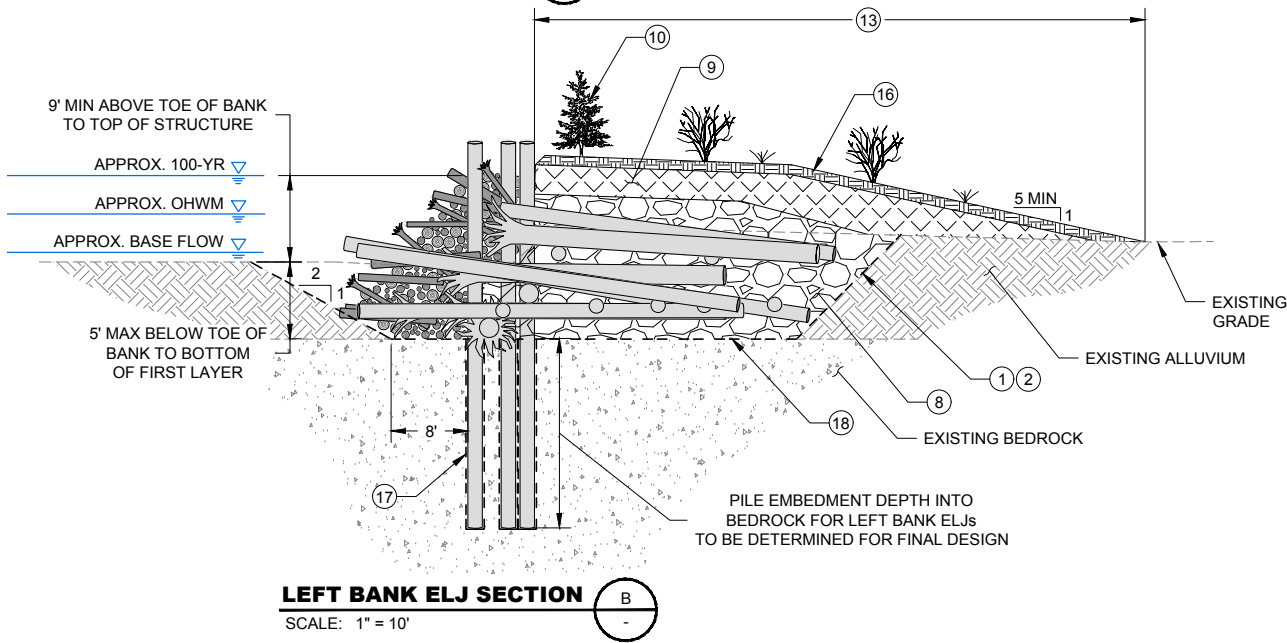
- 7 LAYERS 2, 3, 4, 5 AND 6 SHALL EXTEND THROUGH RACKING MATERIAL.
- 8 PLACE LOG BALLAST MATERIAL FROM THE TOE UP TO THE TOP OF THE ELJ AT MATERIAL ANGLE OF REPOSE (APPROX 1.5H:1V) AT DOWNSTREAM END OF ELJ.
- 9 MAINTAIN A MINIMUM DEPTH OF 3-FEET OF NATIVE ALLUVIUM BACKFILL MATERIAL OVER TOP OF IMPORTED BALLAST MATERIAL.
- 10 PLANTING TOP OF ELJ AND DISTURBED BANK TO BE COMPLETED BY OTHERS.
- 11 DO NOT BACKFILL UPSTREAM OF ELJ, LEAVE AS POOL.
- 12 ADJUST FINAL GRADE ON BANK SIDE AND DOWNSTREAM SIDE OF ELJ AS NEEDED TO PLACE ALL SUITABLE EXCESS EXCAVATED ALLUVIUM.

- 13 DIMENSION WILL VARY ALONG ELJ TO TRANSITION TO EXISTING GRADE.
- 14 PLACE SALVAGED BRUSH ALONG EDGE OF ELJ BETWEEN SOIL AND RACKING LOGS TO PREVENT BLEEDING SOIL FROM ELJ.
- 15 EXISTING RIVER BED ELEVATION VARIES FOR EACH ELJ. CONTRACTOR SHALL VERIFY WITH ENGINEER THE EXCAVATION DEPTH AND ELJ HEIGHT BASED ON EXISTING RIVER BED ELEVATION AT EACH SITE.
- 16 12-INCHES OF TOPSOIL AND 4-INCHES OF MULCH TO BE PLACED ABOVE OHWM AS DIRECTED BY ENGINEER.
- 17 TIMBER PILES SHALL BE DRIVEN OR PLACED INTO VERTICAL DRILLED ROCK SHAFTS THROUGH SEDIMENTARY BEDROCK AND EXISTING ALLUVIUM. TRIM PILES ON THREE SIDES AND FIELD FIT TO SHAFT DIAMETER.

- 18 EXCAVATE TO BEDROCK OR TO DIMENSION SHOWN, WHICH EVER IS ENCOUNTERED FIRST, THEN DRILL AND PLACE PILES AND PLACE KEY LOGS AS SHOWN. PLACE BACKFILL TO DIMENSIONS SHOWN.



LEFT BANK ELJ SECTION A
SCALE: 1" = 10'



LEFT BANK ELJ SECTION B
SCALE: 1" = 10'

PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

No.	REVISION	BY	APP'D	DATE

ONE INCH
↑
AT FULL SIZE IF NOT ONE
INCH SCALE ACCORDINGLY



DESIGNED: B. SCOTT	DRAWN: E. MARSHALL
DESIGNED: I. MOSTRENKO	DRAWN: -
DESIGNED: -	CHECKED: I. MOSTRENKO
SCALE: AS NOTED	APPROVED: M. EWBANK

MASHSEL RIVER
REACH 7 RESTORATION PROJECT
SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP

LEFT BANK ELJ PLAN AND SECTIONS

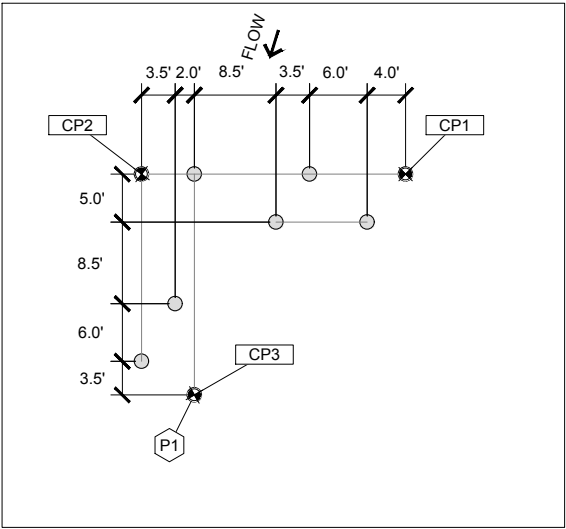
DATE: AUGUST 2016
PROJECT NO: 15-06082-000
DRAWING NO: C-6
SHEET NO: 8 OF 16

ORIGINATED BY: / DATE: /

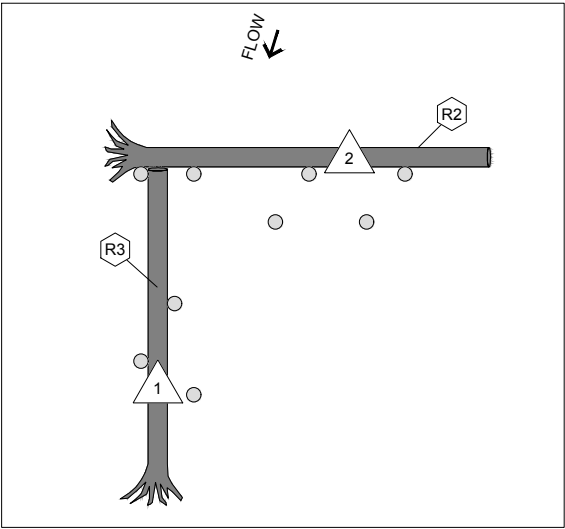
CHECKED BY: / DATE: /

BACK-CHECKED BY: / DATE: /

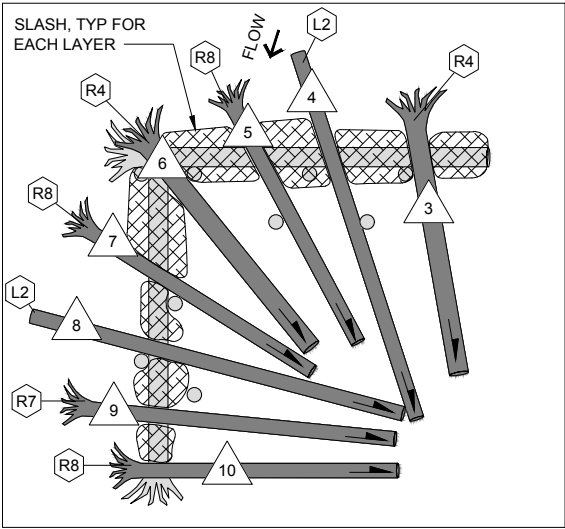
C:\pww\2016\15-06082-000\CAD\dwg\c7.dwg | 8/19/2016 12:34 PM | Eric Marshall



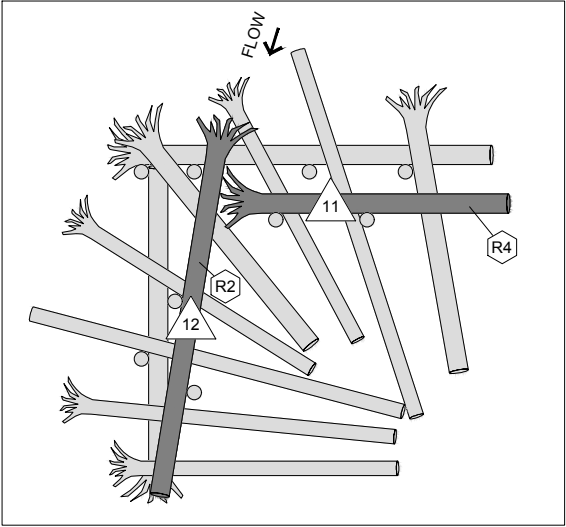
PILE LAYOUT



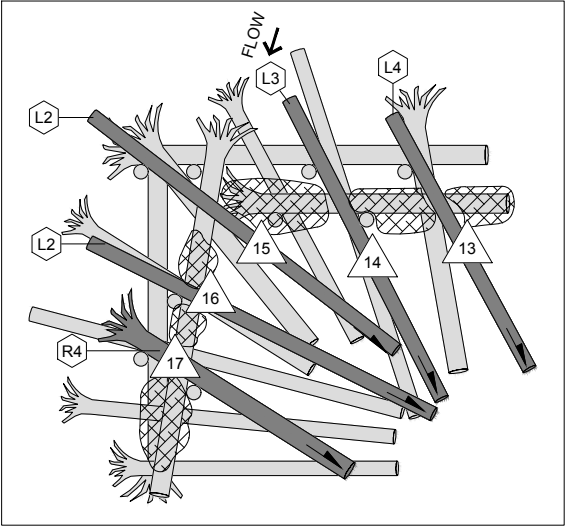
LAYER 1



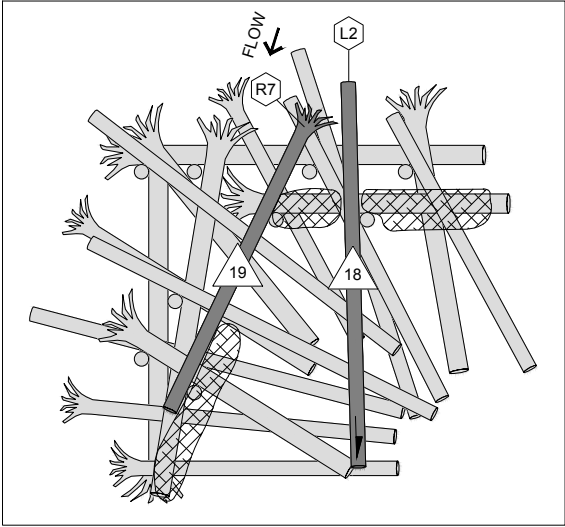
LAYER 2



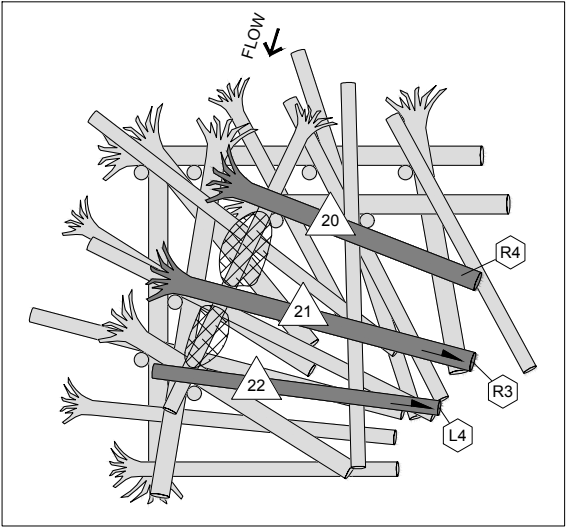
LAYER 3



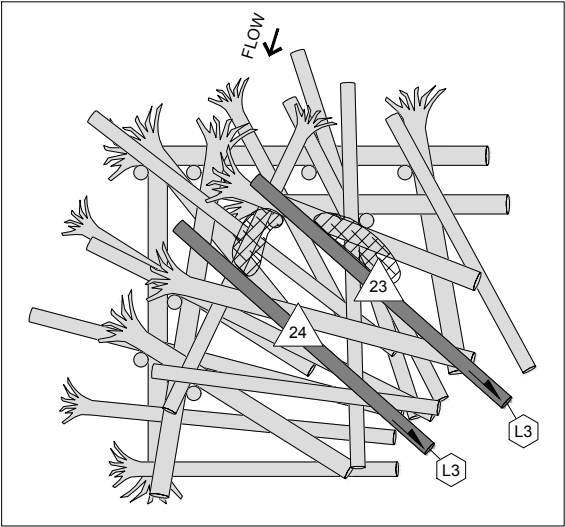
LAYER 4



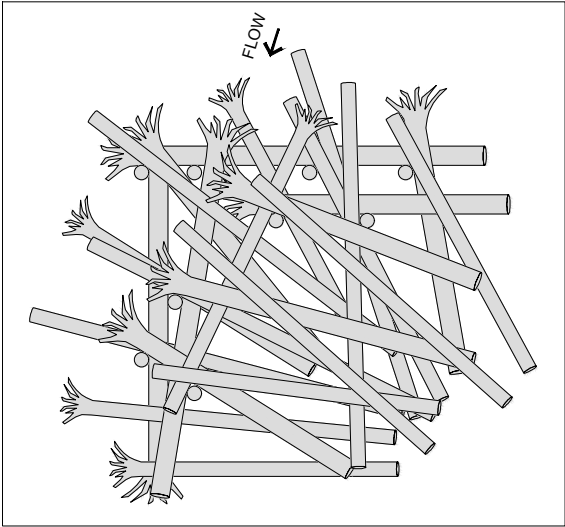
LAYER 5



LAYER 6



LAYER 7



COMPLETE

GENERAL NOTES:

1. FINAL ELJ LOCATION AND ORIENTATION SHALL BE FIELD VERIFIED BY THE ENGINEER PRIOR TO THE CONTRACTOR STAKING PILE LOCATIONS.
2. PILE LOCATIONS SHALL BE STAKED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER PRIOR TO PILE INSTALLATION.
3. PILE LOCATIONS ARE SYMMETRICAL ABOUT THE ELJ CONTROL POINT.
4. PILE LOCATIONS SHALL BE BASED ON THE LOCATION OF THE ELJ CONTROL POINT AND SHALL BE WITHIN 6 INCHES OF THE LOCATION SHOWN ON THE DRAWINGS.
5. LOG MATERIALS SHALL BE PLACED AT THE LOCATIONS, ELEVATIONS AND ORIENTATIONS SPECIFIED ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER.
6. TRIM LOGS TO FIT AS REQUIRED.
7. TRIM PILES A MINIMUM OF 18 INCHES AND A MAXIMUM OF 24 INCHES ABOVE FINAL GRADE.
8. EXCAVATION LIMITS VARY DEPENDING ON THE LOCAL SOIL CONDITIONS AND THE CONSTRUCTION TECHNIQUES EMPLOYED.
9. INSTALL LOGS, RACKING LOGS, SLASH, IMPORTED BALLAST MATERIAL AND NATIVE BACKFILL MATERIAL AS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER.
10. SEE DRAWING C-12 FOR ELJ CONTROL POINT COORDINATES.
11. RACKING NOT SHOWN FOR CLARITY. PLACE RACKING ALONG UPSTREAM FACE AND ALONG THE SIDES OF THE ELJ AS SHOWN ON THE DETAIL SHEET. RACKING SHALL BE PLACED PARALLEL TO AND BETWEEN PILES EXTENDING OUT FROM THE ELJ. ALL RACKING SHALL BE PLACED TO CREATE AN INTERLOCKING MATRIX OF LOGS SECURED BETWEEN PILES AND KEY LOGS. PLACE SLASH AT SAME TIME AS RACKING TO FILL VOIDS BETWEEN RACKING.

ELJ CONSTRUCTION SEQUENCE NOTES:

1. INSTALL PILES TO SPECIFIED DEPTH.
2. INSTALL LAYER 1 AND LAYER 2 LOGS, RACKING LOGS, SLASH AND FIRST LIFT OF IMPORTED OF BALLAST MATERIAL.
4. FILL ALL VOIDS IN BALLAST MATERIAL WITH NATIVE BACKFILL MATERIAL.
5. INSTALL LAYER 3 AND LAYER 4 LOGS, RACKING LOGS, SLASH AND SECOND LIFT OF IMPORTED BALLAST MATERIAL.
6. FILL ALL VOIDS IN BALLAST MATERIAL WITH NATIVE BACKFILL MATERIAL.
7. INSTALL LAYER 5 AND LAYER 6 LOGS, RACKING LOGS, SLASH AND THIRD LIFT OF IMPORTED BALLAST MATERIAL.
8. FILL ALL VOIDS IN BALLAST MATERIAL WITH NATIVE BACKFILL MATERIAL.
9. INSTALL LAYER 7 LOGS, RACKING LOGS, SLASH AND FOURTH LIFT OF IMPORTED BALLAST MATERIAL.
10. COMPLETELY BACKFILL REMAINDER OF ELJ INTERIOR AND CONSTRUCT DEPOSITIONAL BAR WITH NATIVE BACKFILL MATERIAL TO GRADE AND EXTENTS SHOWN ON ELJ PLAN.
11. PLACE TOPSOIL AND MULCH OVER TOP OF ELJ AS SHOWN ON ELJ PLAN.

LOG SCHEDULE - LEFT BANK ELJ:

LOG TYPE	MINIMUM DIAMETER (IN)	LENGTH (FT)	ROOTWAD	TOTAL QTY PER ELJ
P1	18	40	NO	9
R2	24	40	YES	2
R3	24	35	YES	2
R4	24	30	YES	5
R7	18	35	YES	2
R8	18	30	YES	3
L2	18	40	NO	5
L3	18	35	NO	3
L4	18	30	NO	2
RACKING	4-16	15-30	OPTIONAL	150
SLASH				100 CY

LEGEND:

PREVIOUS LAYER KEY LOG

CURRENT KEY LOG LAYER

TIMBER PILE

LOG SEQUENCING ORDER

ELJ CONTROL POINT

LOG SLOPE (DOWN)

LOG TYPE ID (LOG TYPE R1)

PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

No.	REVISION	BY	APP'D	DATE

ONE INCH
↑
AT FULL SIZE, IF NOT ONE
INCH SCALE ACCORDINGLY

811
Know what's below.
Call before you dig.

HERRERA

SOUTH PUGET SOUND
Salmon
ENHANCEMENT
GROUP

DRAFT
I. MOSTRENKO
REGISTERED PROFESSIONAL ENGINEER
56069

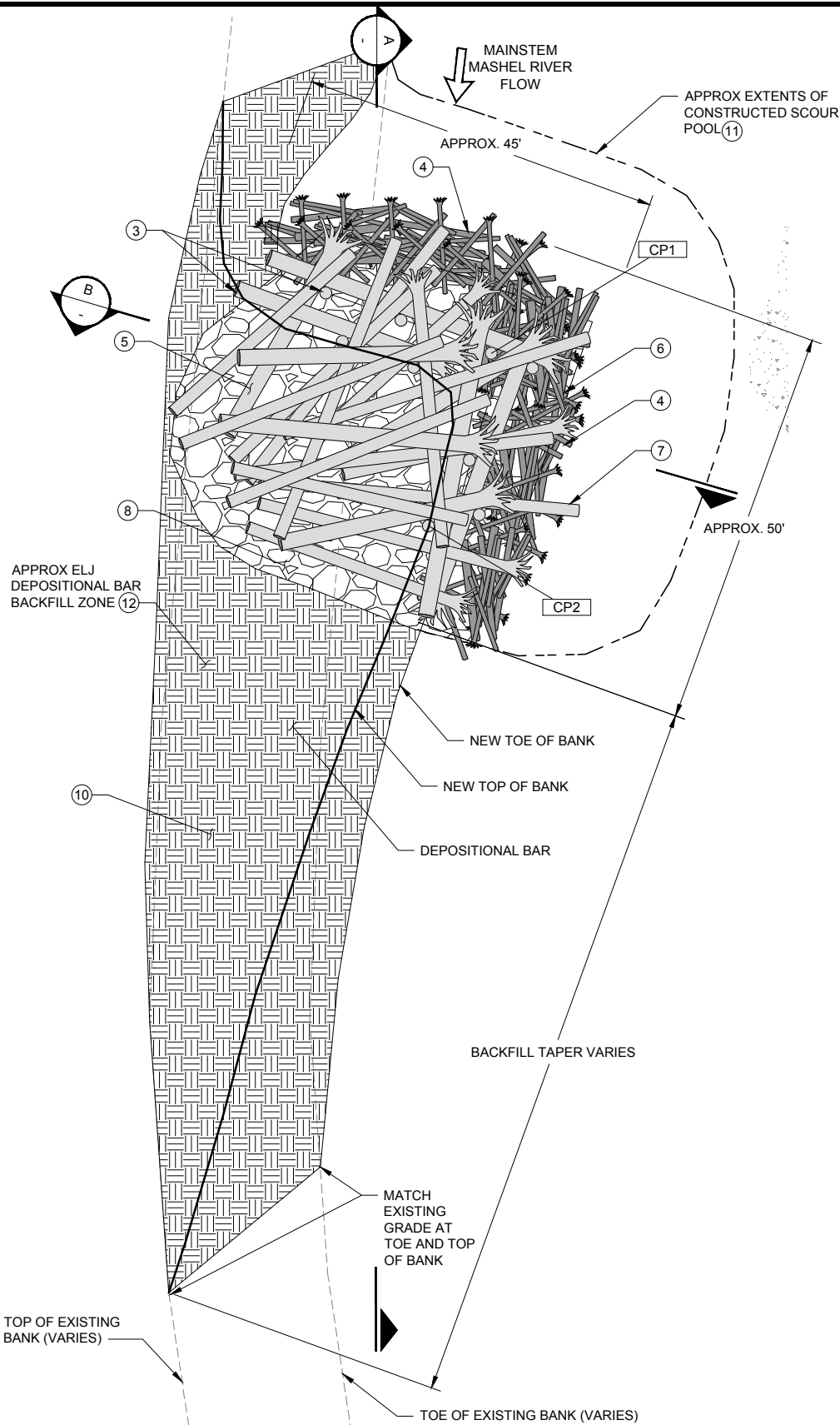
DESIGNED: B. SCOTT
DRAWN: E. MARSHALL
DESIGNED: I. MOSTRENKO
DRAWN: -
DESIGNED: -
CHECKED: I. MOSTRENKO
SCALE: AS NOTED
APPROVED: M. EWBANK

MASHEL RIVER
REACH 7 RESTORATION PROJECT
SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP
LEFT BANK ELJ LAYERING PLAN

DATE: AUGUST 2016
PROJECT NO: 15-06082-000
DRAWING NO: C-7
SHEET NO: 9 OF 16

ORIGINATED BY: / DATE: /
CHECKED BY: / DATE: /
BACK-CHECKED BY: / DATE: /
C:\pww\2016\15-06082-000\CADD\DWG\C-8.dwg | 8/19/2016 12:34 PM | Eric Marshall

CORRECTED BY: / DATE: /
VERIFIED BY: / DATE: /

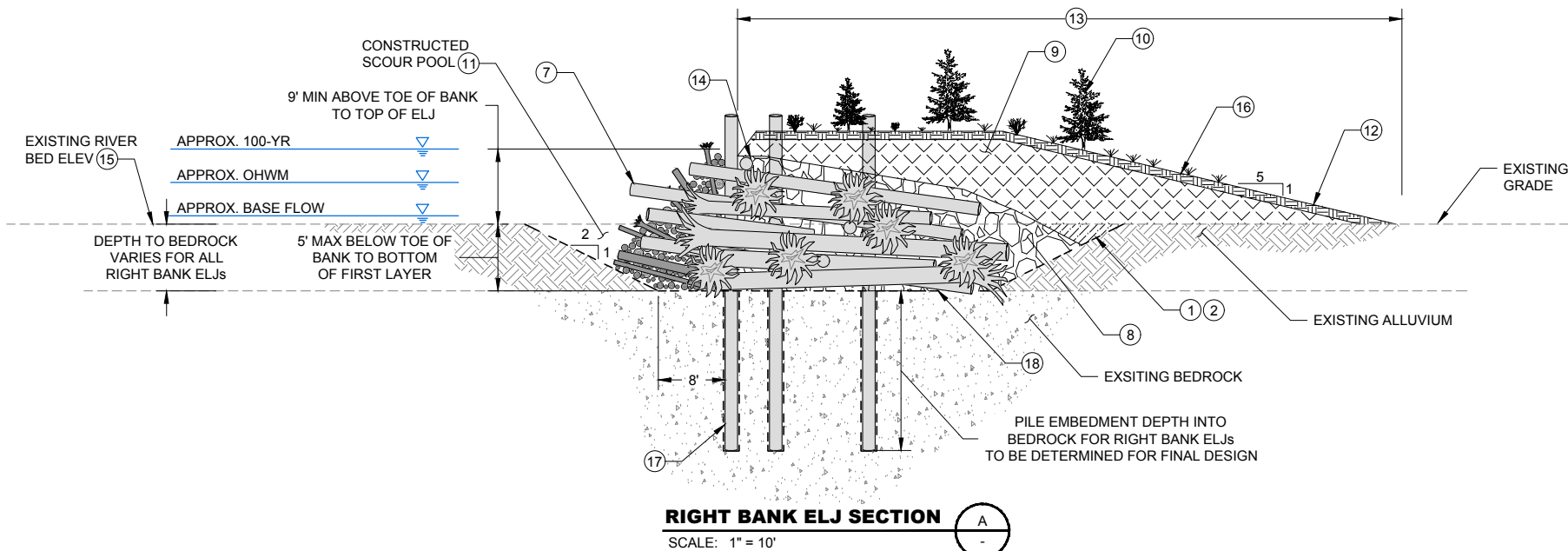


RIGHT BANK ELJ PLAN VIEW
SCALE: 1" = 10'

1
C-3

CONSTRUCTION KEY NOTES:

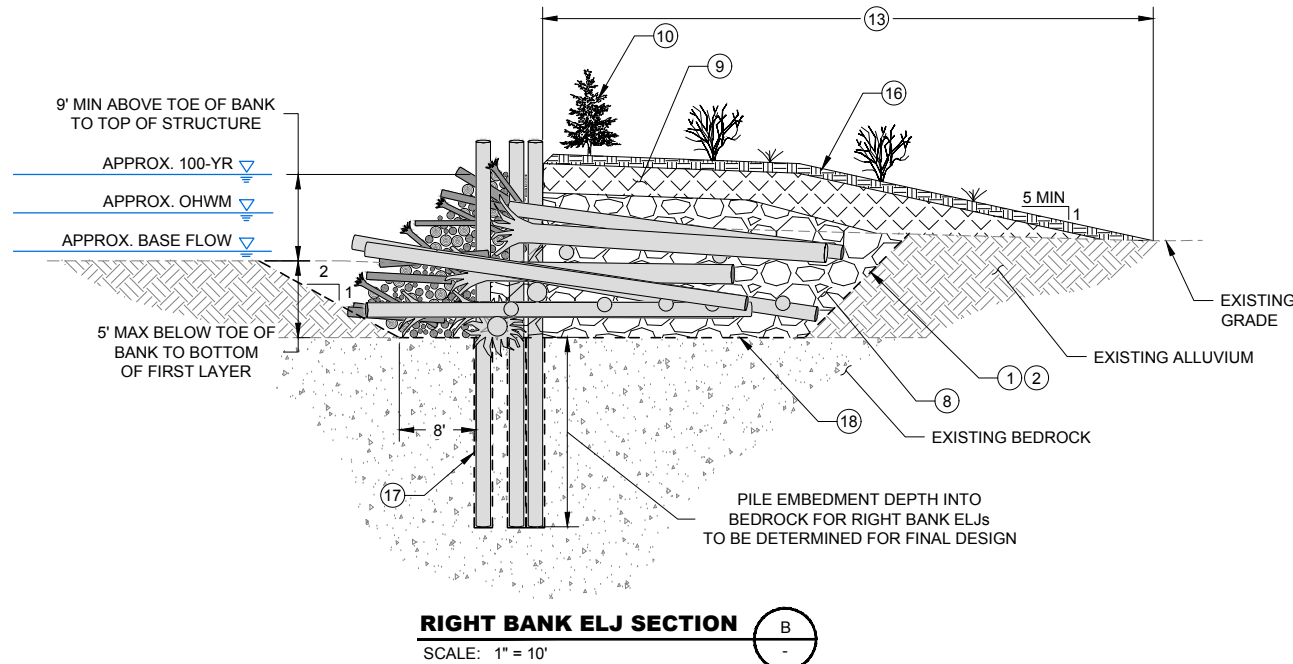
- APPROXIMATE ELJ EXCAVATION LIMITS.
- EXCAVATED SIDE SLOPES VARY BASED ON CONSTRUCTION ACCESS NEEDS.
- PLACE PILES AND KEY MEMBERS ACCORDING TO ELJ LAYERING PLAN.
- SMALL WOODY DEBRIS AND SLASH EMBEDDED INTO FLANKS OF ELJ IN AND AROUND INTERFACE OF KEY LOGS AND RACKING LOGS PRIOR TO BACKFILLING, EXTENDING FROM BASE TO 3-FEET ABOVE EXISTING GRADE.
- COORDINATE WITH ENGINEER PRIOR TO PLACING SALVAGED RIPRAP, ALLUVIUM AND IMPORTED RIPRAP FOR LOG BALLAST.
- COORDINATE WITH ENGINEER PRIOR TO PLACING RACKING LOGS AND SLASH.
- LAYERS 2, 3, 4, 5 AND 6 SHALL EXTEND THROUGH RACKING MATERIAL.
- PLACE LOG BALLAST MATERIAL FROM THE TOE UP TO THE TOP OF THE ELJ AT MATERIAL ANGLE OF REPOSE (APPROX 1.5H:1V) AT DOWNSTREAM END OF ELJ.
- MAINTAIN A MINIMUM DEPTH OF 3-FEET OF NATIVE ALLUVIUM BACKFILL MATERIAL OVER TOP OF IMPORTED BALLAST MATERIAL.
- PLANTING TOP OF ELJ AND DISTURBED BANK TO BE COMPLETED BY OTHERS.
- DO NOT BACKFILL UPSTREAM OF ELJ, LEAVE AS POOL.
- ADJUST FINAL GRADE ON BANK SIDE AND DOWNSTREAM SIDE OF ELJ AS NEEDED TO PLACE ALL SUITABLE EXCESS EXCAVATED ALLUVIUM.
- DIMENSION WILL VARY ALONG ELJ TO TRANSITION TO EXISTING GRADE.
- PLACE SALVAGED BRUSH ALONG EDGE OF ELJ BETWEEN SOIL AND RACKING LOGS TO PREVENT BLEEDING SOIL FROM ELJ.
- EXISTING RIVER BED ELEVATION VARIES FOR EACH ELJ. CONTRACTOR SHALL VERIFY WITH ENGINEER THE EXCAVATION DEPTH AND ELJ HEIGHT BASED ON EXISTING RIVER BED ELEVATION AT EACH SITE.
- 12-INCHES OF TOPSOIL AND 4-INCHES OF MULCH TO BE PLACED ABOVE OHWM AS DIRECTED BY ENGINEER.
- TIMBER PILES SHALL BE DRIVEN OR PLACED INTO VERTICAL DRILLED ROCK SHAFTS THROUGH SEDIMENTARY BEDROCK AND EXISTING ALLUVIUM. TRIM PILES ON THREE SIDES AND FIELD FIT TO SHAFT DIAMETER.
- EXCAVATE TO BEDROCK OR TO DIMENSION SHOWN, WHICH EVER IS ENCOUNTERED FIRST, THEN DRILL AND PLACE PILES AND PLACE KEY LOGS AS SHOWN. PLACE BACKFILL TO DIMENSIONS SHOWN.



RIGHT BANK ELJ SECTION

SCALE: 1" = 10'

A



RIGHT BANK ELJ SECTION

SCALE: 1" = 10'

B

PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

No.	REVISION	BY	APP'D	DATE

ONE INCH
↑
AT FULL SIZE, IF NOT ONE
INCH SCALE ACCORDINGLY



DESIGNED: B. SCOTT	DRAWN: E. MARSHALL
DESIGNED: I. MOSTRENKO	DRAWN: -
DESIGNED: -	CHECKED: I. MOSTRENKO
SCALE: AS NOTED	APPROVED: M. EWBANK

MASHEL RIVER
REACH 7 RESTORATION PROJECT
SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP

RIGHT BANK ELJ PLAN AND SECTIONS

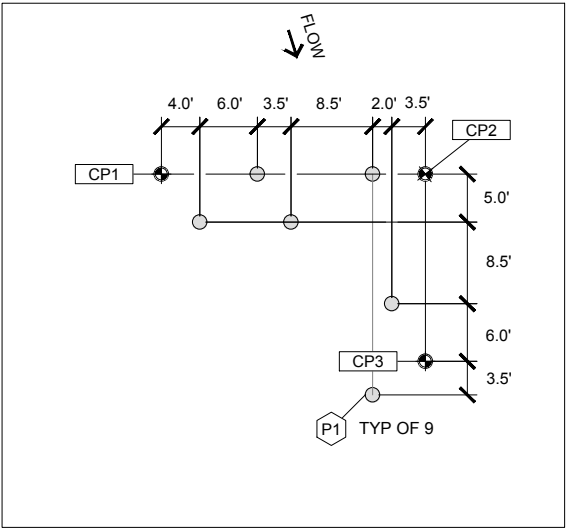
DATE: AUGUST 2016
PROJECT NO: 15-06082-000
DRAWING NO: C-8
SHEET NO: 10 OF 16

ORIGINATED BY: / DATE: /

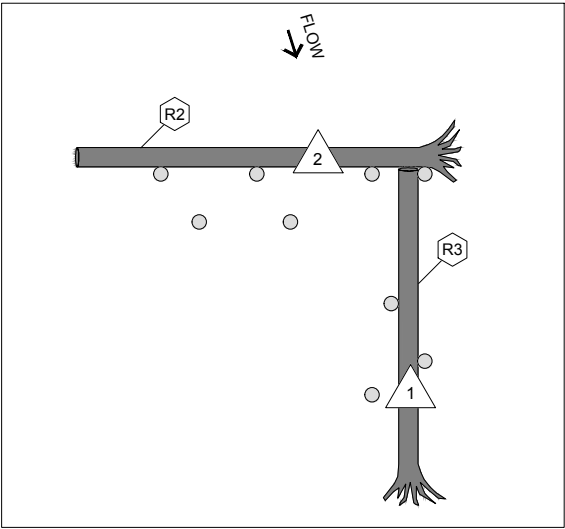
CHECKED BY: / DATE: /

BACK-CHECKED BY: / DATE: /

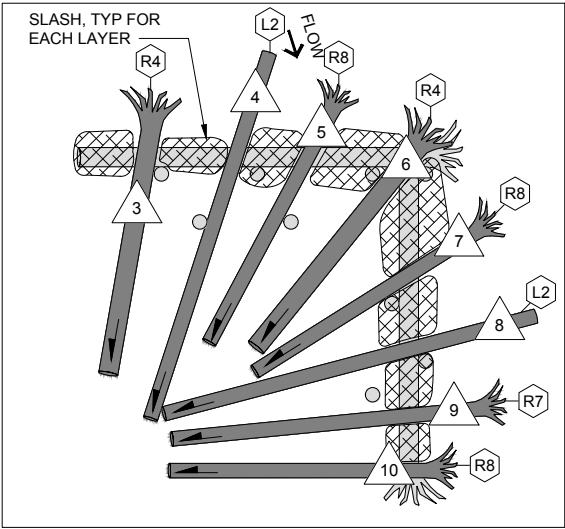
C:\pww\2016\15-06082-000\CAD\DWG\C-9.dwg | 8/19/2016 12:34 PM | Eric Marshall



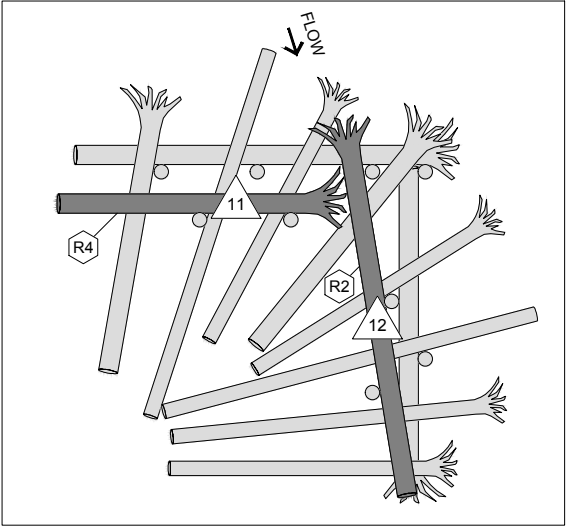
PILE LAYOUT



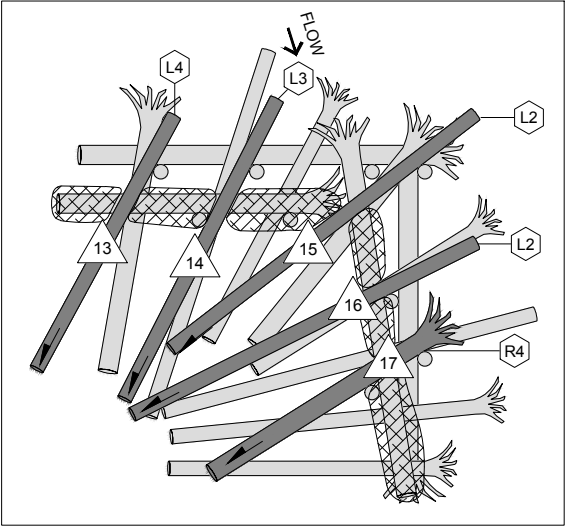
LAYER 1



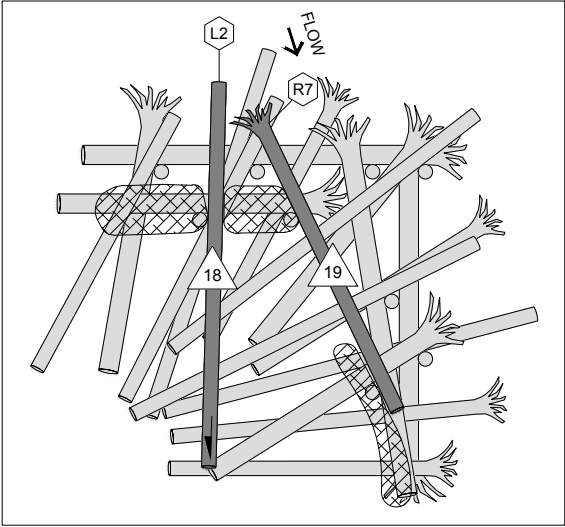
LAYER 2



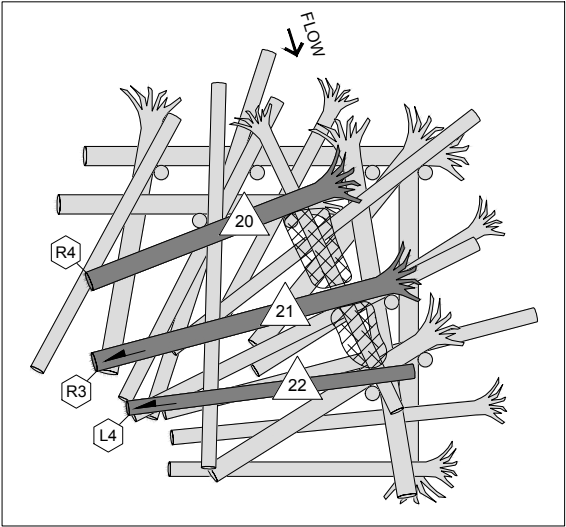
LAYER 3



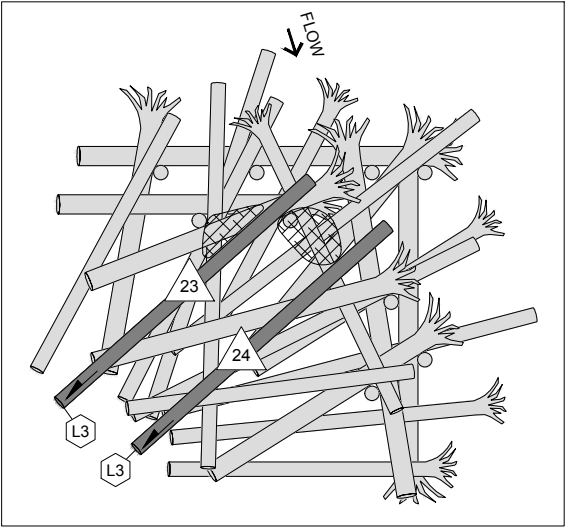
LAYER 4



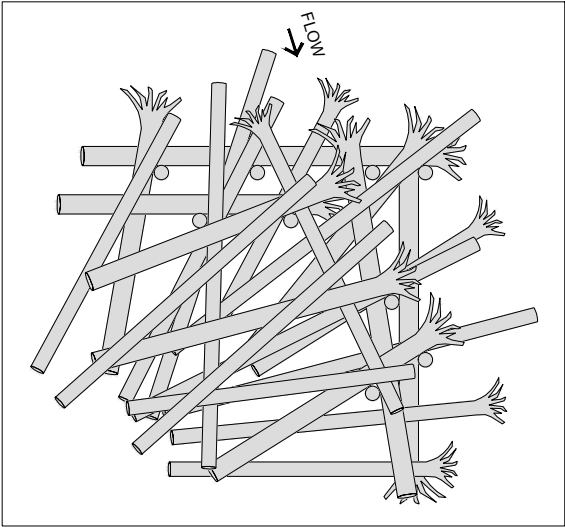
LAYER 5



LAYER 6



LAYER 7



COMPLETE

GENERAL NOTES:

1. FINAL ELJ LOCATION AND ORIENTATION SHALL BE FIELD VERIFIED BY THE ENGINEER PRIOR TO THE CONTRACTOR STAKING PILE LOCATIONS.
2. PILE LOCATIONS SHALL BE STAKED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER PRIOR TO PILE INSTALLATION.
3. PILE LOCATIONS ARE SYMMETRICAL ABOUT THE ELJ CONTROL POINT.
4. PILE LOCATIONS SHALL BE BASED ON THE LOCATION OF THE ELJ CONTROL POINT AND SHALL BE WITHIN 6 INCHES OF THE LOCATION SHOWN ON THE DRAWINGS.
5. LOG MATERIALS SHALL BE PLACED AT THE LOCATIONS, ELEVATIONS AND ORIENTATIONS SPECIFIED ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER.
6. TRIM LOGS TO FIT AS REQUIRED.
7. TRIM PILES A MINIMUM OF 18 INCHES AND A MAXIMUM OF 24 INCHES ABOVE FINAL GRADE.
8. EXCAVATION LIMITS VARY DEPENDING ON THE LOCAL SOIL CONDITIONS AND THE CONSTRUCTION TECHNIQUES EMPLOYED.
9. INSTALL LOGS, RACKING LOGS, SLASH, IMPORTED BALLAST MATERIAL AND NATIVE BACKFILL MATERIAL AS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER.
10. SEE DRAWING C-12 FOR ELJ CONTROL POINT COORDINATES.
11. RACKING NOT SHOWN FOR CLARITY. PLACE RACKING ALONG UPSTREAM FACE AND ALONG THE SIDES OF THE ELJ AS SHOWN ON THE DETAIL SHEET. RACKING SHALL BE PLACED PARALLEL TO AND BETWEEN PILES EXTENDING OUT FROM THE ELJ. ALL RACKING SHALL BE PLACED TO CREATE AN INTERLOCKING MATRIX OF LOGS SECURED BETWEEN PILES AND KEY LOGS. PLACE SLASH AT SAME TIME AS RACKING TO FILL VOIDS BETWEEN RACKING.

ELJ CONSTRUCTION SEQUENCE NOTES:

1. INSTALL PILES TO SPECIFIED DEPTH.
2. INSTALL LAYER 1 AND LAYER 2 LOGS, RACKING LOGS, SLASH AND FIRST LIFT OF IMPORTED OF BALLAST MATERIAL.
4. FILL ALL VOIDS IN BALLAST MATERIAL WITH NATIVE BACKFILL MATERIAL.
5. INSTALL LAYER 3 AND LAYER 4 LOGS, RACKING LOGS, SLASH AND SECOND LIFT OF IMPORTED BALLAST MATERIAL.
6. FILL ALL VOIDS IN BALLAST MATERIAL WITH NATIVE BACKFILL MATERIAL.
7. INSTALL LAYER 5 AND LAYER 6 LOGS, RACKING LOGS, SLASH AND THIRD LIFT OF IMPORTED BALLAST MATERIAL.
8. FILL ALL VOIDS IN BALLAST MATERIAL WITH NATIVE BACKFILL MATERIAL.
9. INSTALL LAYER 7 LOGS, RACKING LOGS, SLASH AND FOURTH LIFT OF IMPORTED BALLAST MATERIAL.
10. COMPLETELY BACKFILL REMAINDER OF ELJ INTERIOR AND CONSTRUCT DEPOSITIONAL BAR WITH NATIVE BACKFILL MATERIAL TO GRADE AND EXTENTS SHOWN ON ELJ PLAN.
11. PLACE TOPSOIL AND MULCH OVER TOP OF ELJ AS SHOWN ON ELJ PLAN.

LOG SCHEDULE - RIGHT BANK ELJ:

LOG TYPE	MINIMUM DIAMETER (IN)	LENGTH (FT)	ROOTWAD	TOTAL QTY PER ELJ
P1	18	40	NO	9
R2	24	40	YES	2
R3	24	35	YES	2
R4	24	30	YES	5
R7	18	35	YES	2
R8	18	30	YES	3
L2	18	40	NO	5
L3	18	35	NO	3
L4	18	30	NO	2
RACKING	4-16	15-30	OPTIONAL	150
SLASH				100 CY

LEGEND:

PREVIOUS LAYER KEY LOG

CURRENT KEY LOG LAYER

TIMBER PILE

LOG SEQUENCING ORDER

ELJ CONTROL POINT

LOG SLOPE (DOWN)

LOG TYPE ID (LOG TYPE R1)

PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

No.	REVISION	BY	APP'D	DATE

ONE INCH
↑
AT FULL SIZE, IF NOT ONE
INCH SCALE ACCORDINGLY
↓



DESIGNED: B. SCOTT	DRAWN: E. MARSHALL
DESIGNED: I. MOSTRENKO	DRAWN: -
DESIGNED: -	CHECKED: I. MOSTRENKO
SCALE: AS NOTED	APPROVED: M. EWBANK

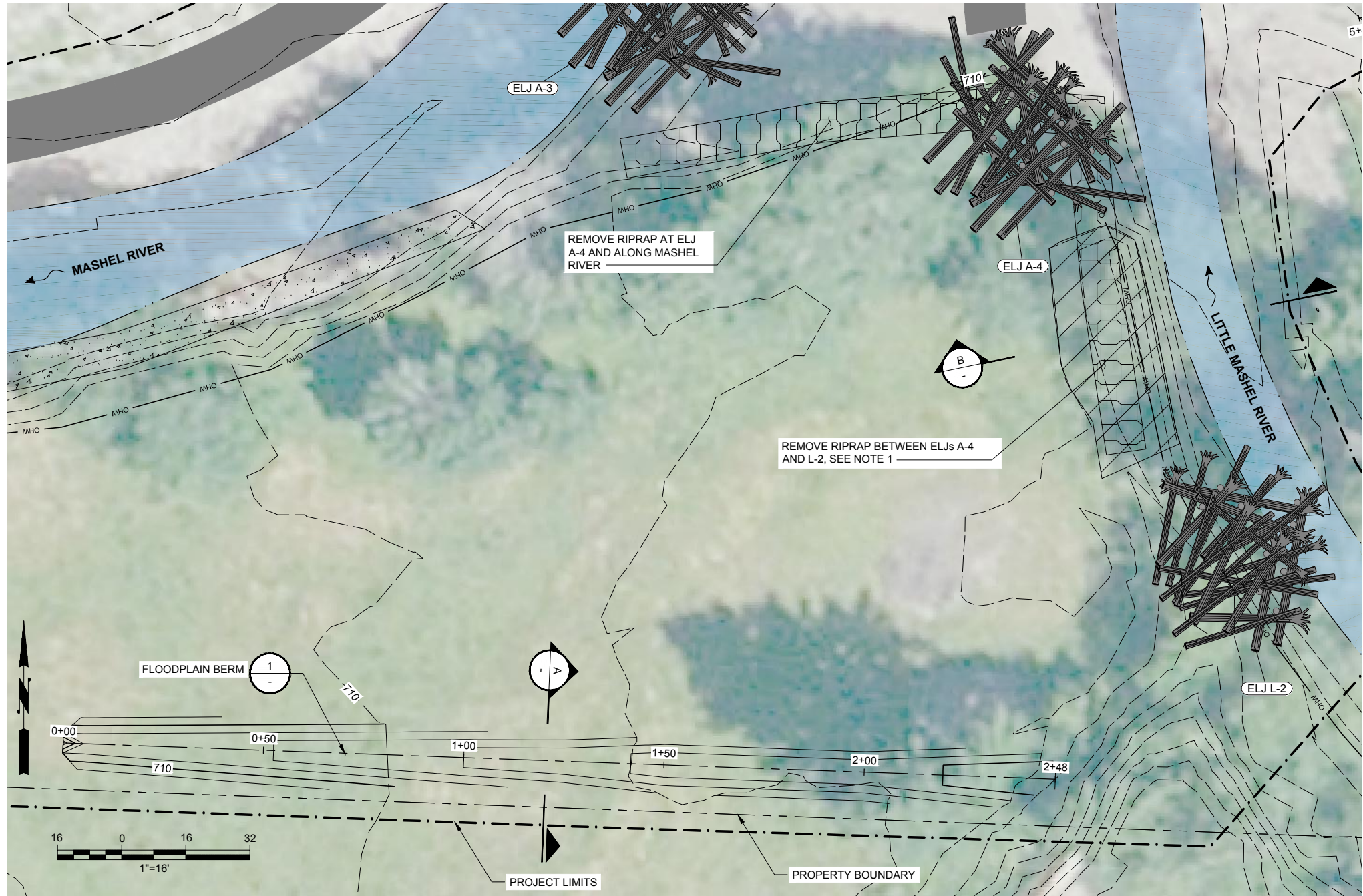
MASHEL RIVER
REACH 7 RESTORATION PROJECT
SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP

RIGHT BANK ELJ LAYERING PLAN

DATE:	
AUGUST 2016	
PROJECT NO:	
15-06082-000	
DRAWING NO:	
C-9	
SHEET NO:	OF
11	16

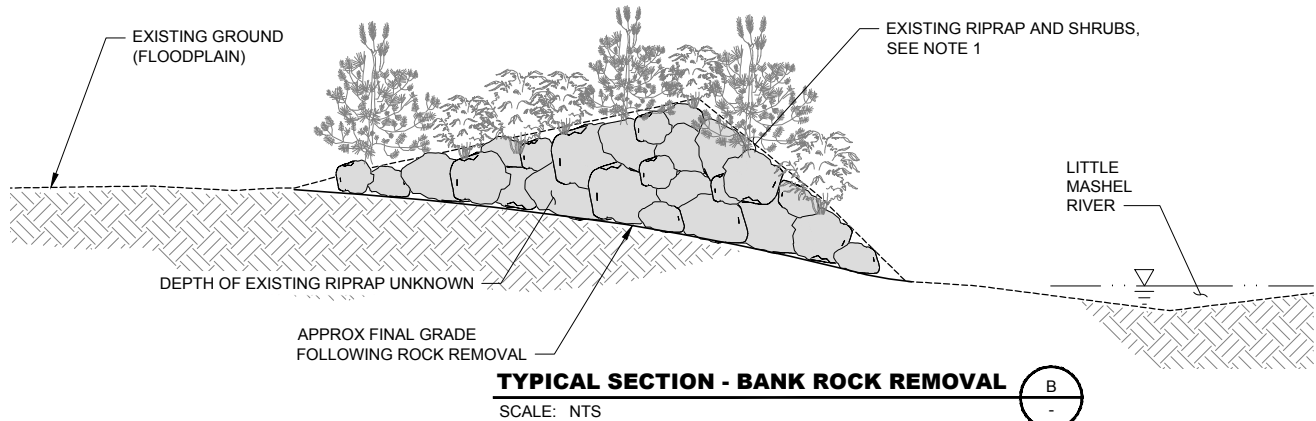
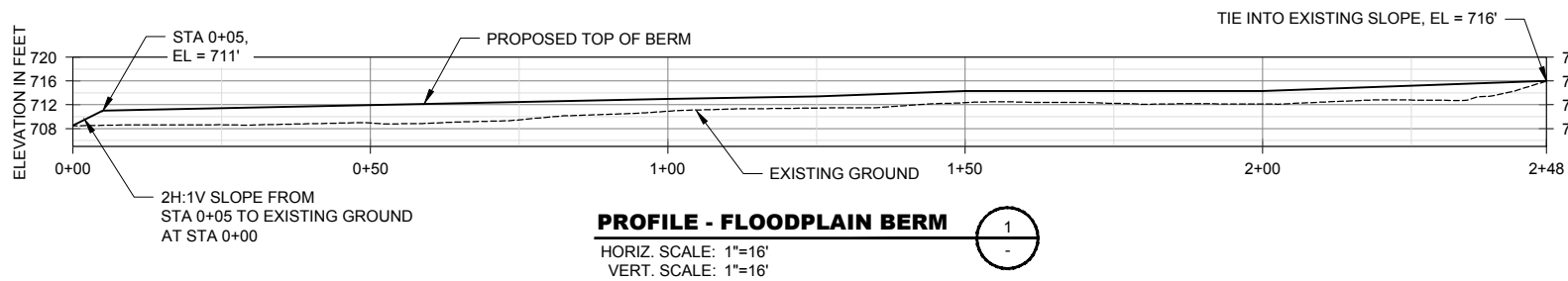
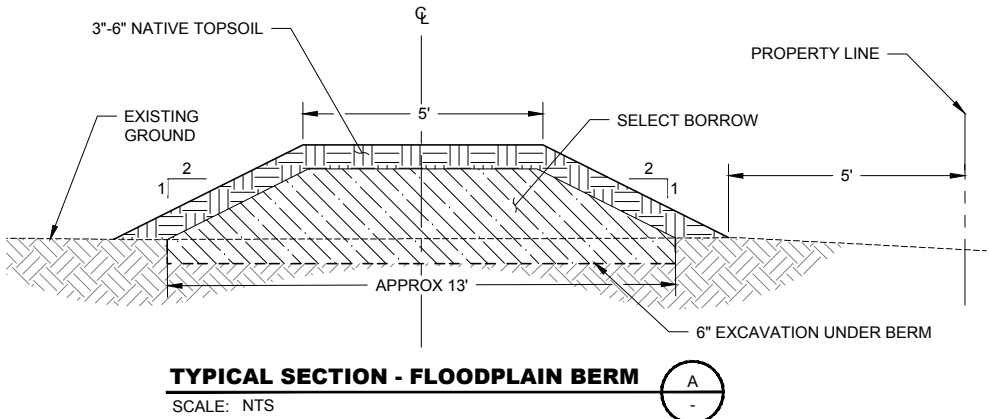
ORIGINATED BY: / DATE: /
CHECKED BY: / DATE: /
BACK-CHECKED BY: / DATE: /
CORRECTED BY: / DATE: /
VERIFIED BY: / DATE: /

C:\p001\201615-06082-000\CADD\DWG\C-10.dwg | 8/19/2016 12:35 PM | Eric Marshall



NOTES:

1. REMOVE ALL RIPRAP AND VEGETATION GROWING AMIDST THE ROCK ALONG BANK AND ON FLOODPLAIN BETWEEN ELJs A-4 AND L-2. STOCKPILE ROCK FOR USE AS BACKFILL FOR ELJs. FINAL MAXIMUM GRADE OF FLOODPLAIN AFTER ROCK REMOVAL SHALL BE EL 714'. EXTENTS OF ROCK SHOWN ARE APPROXIMATE.
2. RIPRAP REMOVED TO CONSTRUCT ELJs A-3, A-4, AND L-2 SHALL BE USED AS LOG BALLAST MATERIAL WITHIN THE INTERIOR CORE OF THOSE ELJs.



PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

No.	REVISION	BY	APP'D	DATE

ONE INCH
↑
AT FULL SIZE, IF NOT ONE
INCH SCALE ACCORDINGLY



DESIGNED: B. SCOTT	DRAWN: E. MARSHALL
DESIGNED: I. MOSTRENKO	DRAWN: -
DESIGNED: -	CHECKED: I. MOSTRENKO
SCALE: AS NOTED	APPROVED: M. EWBANK

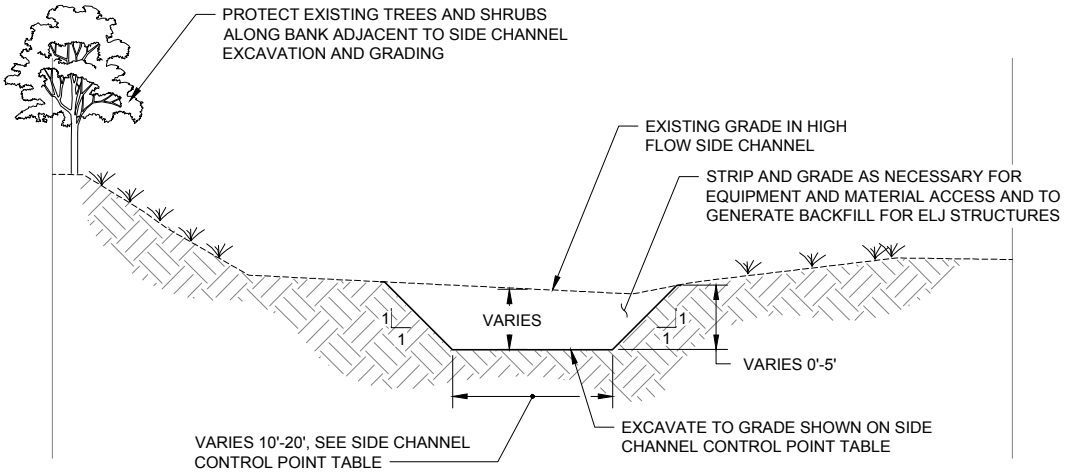
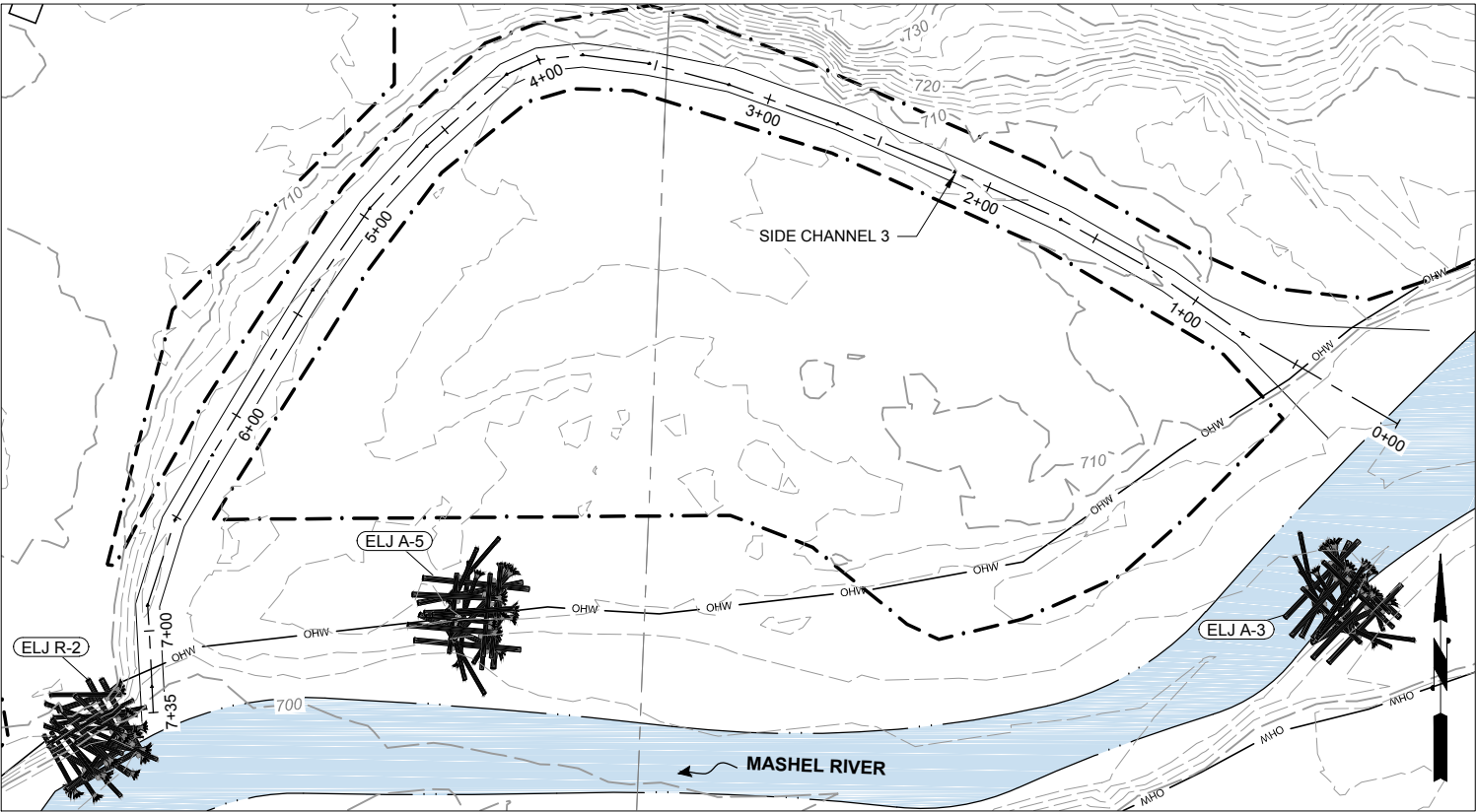
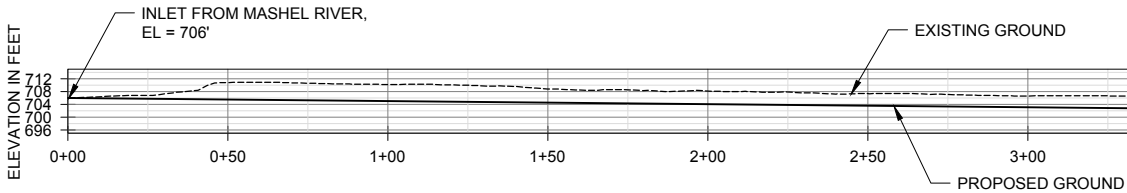
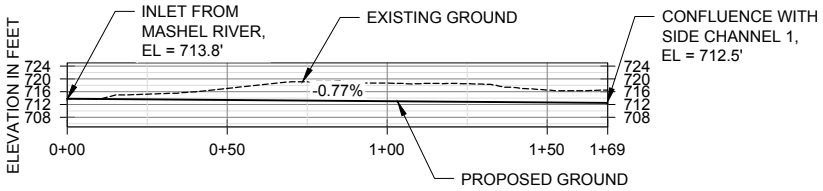
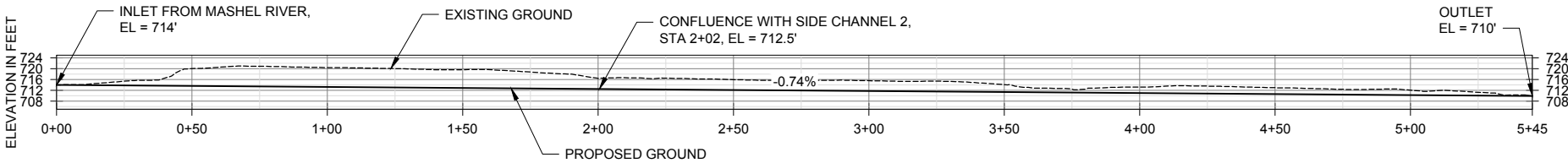
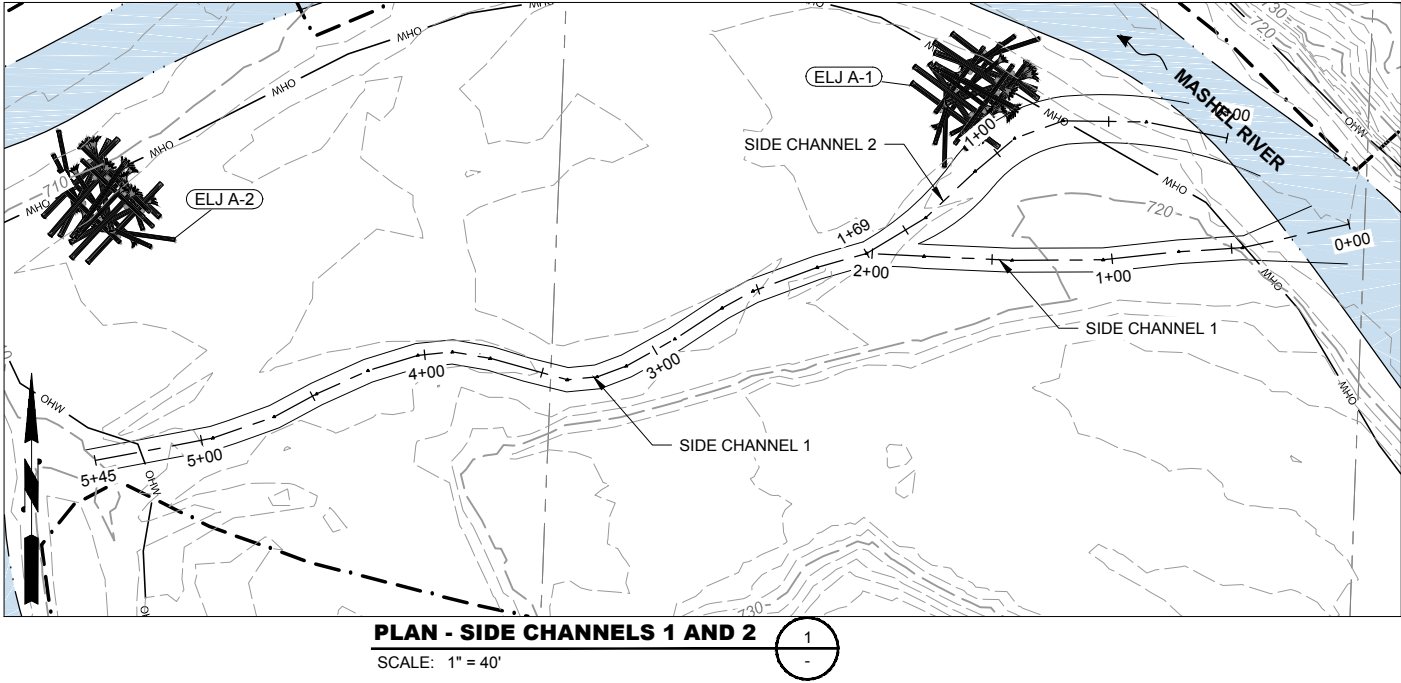
MASHIEL RIVER REACH 7 RESTORATION PROJECT SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP
FLOODPLAIN DETAILS

DATE:	
AUGUST 2016	
PROJECT NO:	
15-06082-000	
DRAWING NO:	
C-10	
SHEET NO:	OF
12	16

ORIGINATED BY: / DATE: /
CHECKED BY: / DATE: /
BACK-CHECKED BY: / DATE: /

CORRECTED BY: / DATE: /
VERIFIED BY: / DATE: /

0:\proj\2016\15-06082-000\CADD\dwg\c-11.dwg | 8/19/2016 12:38 PM | Eric Marshall



PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

No.	REVISION	BY	APP'D	DATE

ONE INCH
↑
AT FULL SIZE, IF NOT ONE
INCH SCALE ACCORDINGLY



DESIGNED: B. SCOTT	DRAWN: E. MARSHALL
DESIGNED: I. MOSTRENKO	DRAWN: -
DESIGNED: -	CHECKED: I. MOSTRENKO
SCALE: AS NOTED	APPROVED: M. EW BANK

MASHEL RIVER
REACH 7 RESTORATION PROJECT
SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP

CHANNEL ALIGNMENTS AND PROFILES

DATE: AUGUST 2016
PROJECT NO: 15-06082-000
DRAWING NO: C-11
SHEET NO: 13 OF 16

ORIGINATED BY: / /
CHECKED BY: / /
BACK-CHECKED BY: / /
C:\pww\2016\15-06082-000\CAD\dwg\C-12.dwg | 8/19/2016 12:35 PM | Eric Marshall

CORRECTED BY: / / DATE: / /
VERIFIED BY: / / DATE: / /

SIDE CHANNEL 1 CONTROL POINT TABLE					
STATION	CENTERLINE NORTHING	CENTERLINE EASTING	CHANNEL BOTTOM WIDTH (FT)	CHANNEL BOTTOM ELEVATION (FT)	NOTES

SIDE CHANNEL 2 CONTROL POINT TABLE					
STATION	CENTERLINE NORTHING	CENTERLINE EASTING	CHANNEL BOTTOM WIDTH (FT)	CHANNEL BOTTOM ELEVATION (FT)	NOTES

SIDE CHANNEL 3 CONTROL POINT TABLE					
STATION	CENTERLINE NORTHING	CENTERLINE EASTING	CHANNEL BOTTOM WIDTH (FT)	CHANNEL BOTTOM ELEVATION (FT)	NOTES

ELJ CONTROL POINT TABLE			
ELJ	CONTROL POINT	NORTHING	EASTING
A-1	1		
	2		
	3		
A-2	1		
	2		
	3		
A-3	1		
	2		
	3		
A-4	1		
	2		
	3		
A-5	1		
	2		
	3		
L-1	1		
	2		
	3		
L-2	1		
	2		
	3		
R-1	1		
	2		
	3		
R-2	1		
	2		
	3		

PRELIMINARY DESIGN - NOT FOR CONSTRUCTION					
No.	REVISION	BY	APP'D	DATE	

ONE INCH
↑
AT FULL SIZE, IF NOT ONE
INCH SCALE ACCORDINGLY
↓



Know what's below.
Call before you dig.



HERRERA



SOUTH PUGET SOUND
Salmon
ENHANCEMENT
GROUP



DESIGNED: B. SCOTT	DRAWN: E. MARSHALL
DESIGNED: I. MOSTRENKO	DRAWN: -
DESIGNED: -	CHECKED: I. MOSTRENKO
SCALE: AS NOTED	APPROVED: M. EWBANK

MASHEL RIVER
REACH 7 RESTORATION PROJECT
SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP

CONTROL POINT TABLES

DATE: AUGUST 2016
PROJECT NO: 15-06082-000
DRAWING NO: C-12
SHEET NO: 14
OF 16

ORIGINATED BY: / DATE: /

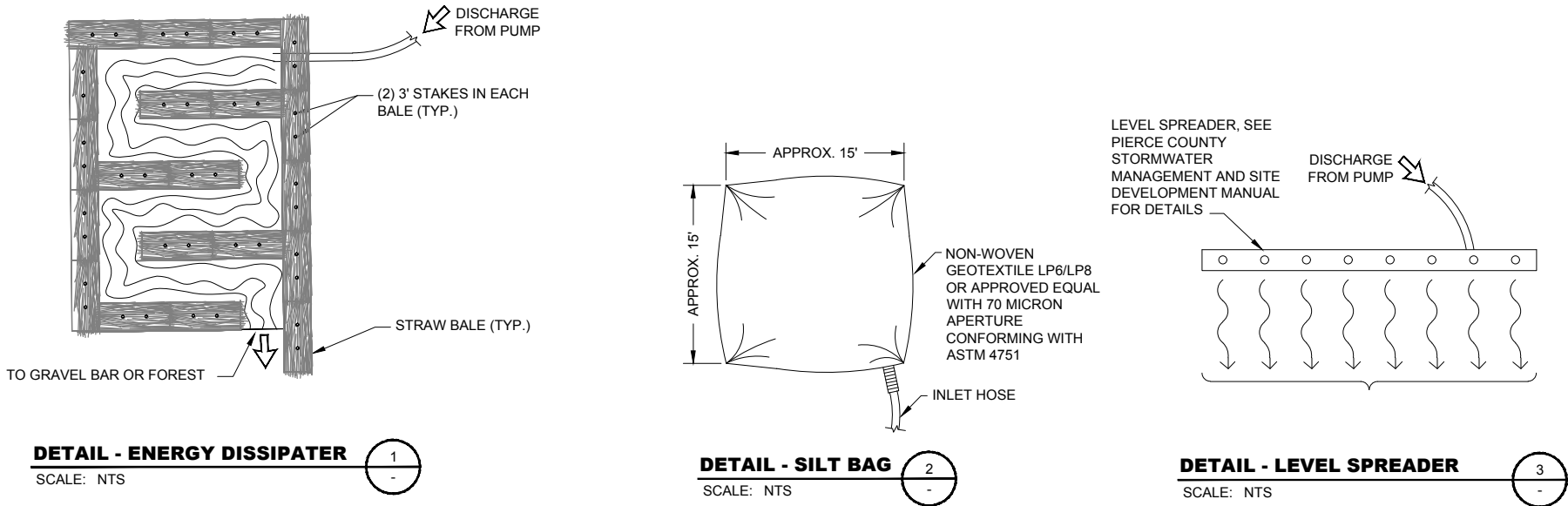
CHECKED BY: / DATE: /

BACK-CHECKED BY: / DATE: /

CORRECTED BY: / DATE: /

VERIFIED BY: / DATE: /

0:\proj\2016\15-06082-000\CADD\dwg\c-13.dwg | 8/19/2016 12:38 PM | Eric Marshall

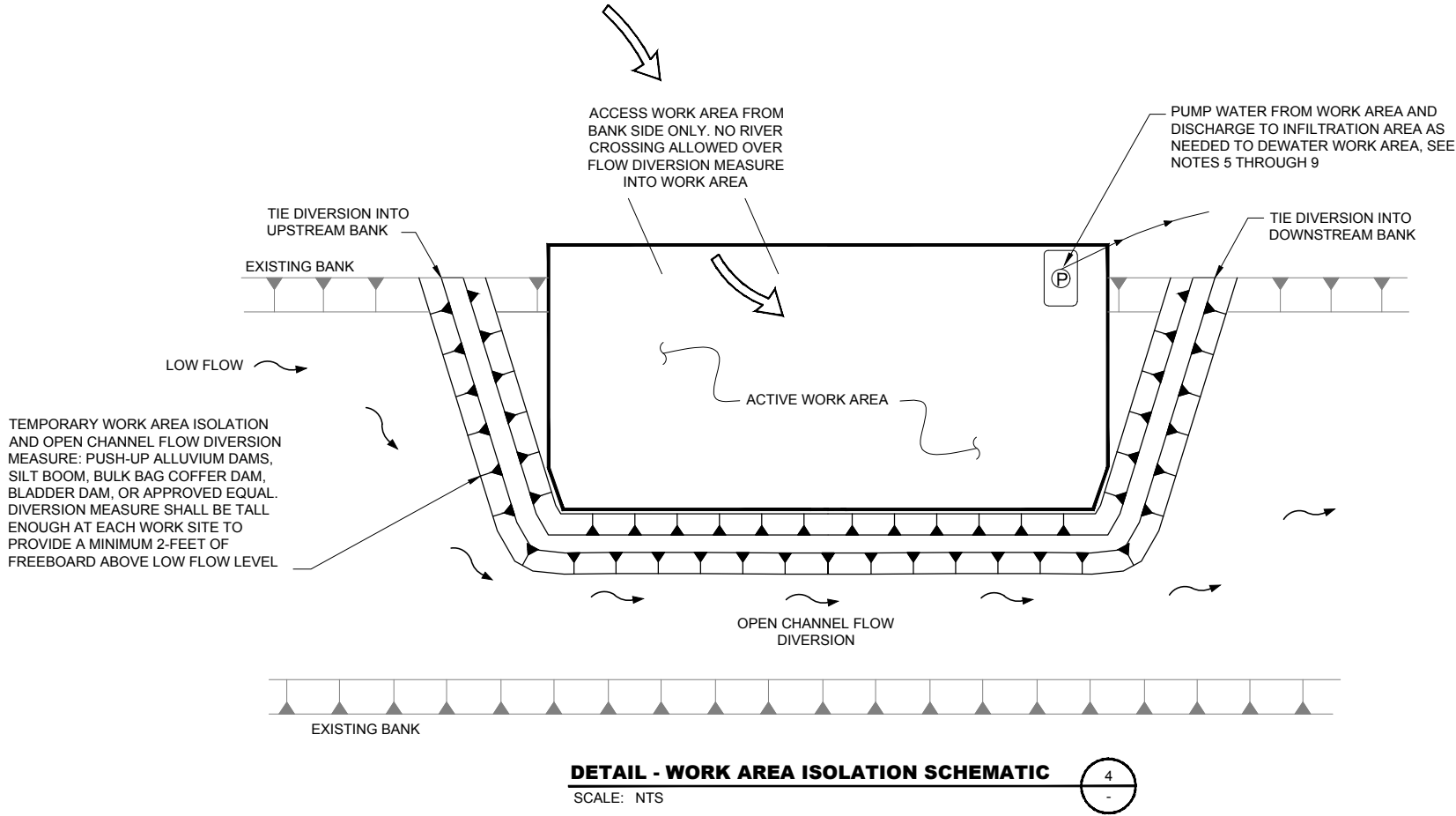


WATER MANAGEMENT NOTES:

- WATER MANAGEMENT METHODS SHALL BE USED TO DIVERT FLOW AND ISOLATE WORK AREAS AS NECESSARY TO COMPLETE CONSTRUCTION OF ELJ STRUCTURES AND TO AVOID IMPACTS TO WATER QUALITY. THE CONTRACTOR SHALL SUBMIT FOR APPROVAL BY THE ENGINEER 5 WORKING DAYS BEFORE INITIATING ANY ONSITE CONSTRUCTION ACTIVITIES, A WATER MANAGEMENT AND WORK AREA ISOLATION PLAN ADDRESSING SITE SPECIFIC TECHNIQUES AND METHODS FOR TEMPORARILY DIVERTING FLOW AND ISOLATING WORK AREAS, AND FOR DEWATERING DURING ELJ STRUCTURE CONSTRUCTION. DIVERSION AND ISOLATION MEANS MAY INCLUDE PUSH-UP DAMS USING NATIVE ALLUVIUM FROM ACTIVE WORK AREAS, SILT BOOMS, BULK BAGS, BLADDER DAMS, OR APPROVED EQUAL AS NECESSARY TO ALLOW CONSTRUCTION WHILE PREVENTING IMPACTS TO WATER QUALITY. COMBINATION OF DIVERSION AND ISOLATION MEASURES MAY BE USED AS NECESSARY. THIS PLAN MAY BE COMBINED WITH THE TESC PLAN.
- SMALL FLOW BY-PASS CHANNELS MAY BE CONSTRUCTED AS NEEDED TO ROUTE FLOW AROUND THE WORK AREA ISOLATION MEASURE AND/OR THE WORK AREA. IF NECESSARY, BEFORE CONSTRUCTING THE BY-PASS CHANNEL THE OWNER SHALL INSTALL FISH EXCLUSION NETS AND COMPLETE ALL FISH REMOVAL BEFORE THE CONTRACTOR CONSTRUCTS AND ACTIVATES THE BY-PASS CHANNEL. COORDINATE WITH THE ENGINEER BEFORE CONSTRUCTING BY-PASS CHANNELS TO VERIFY AND APPROVE CHANNEL SIZE, ALIGNMENT AND SLOPE. BY-PASS CHANNELS MAY BE CONSTRUCTED WITHIN THE MAIN ACTIVE (NON-VEGETATED) CHANNEL, GRAVEL BARS, AND THE FLOODPLAIN NEAR THE ELJ. FOLLOWING COMPLETION OF ELJ CONTRACTOR SHALL RESTORE THE AREA IMPACTED BY THE BY-PASS CHANNEL CONSTRUCTION, BACKFILL THE BY-PASS CHANNEL WITH ALLUVIUM, AND RESTORE FLOW IN THE MAIN CHANNEL TO ITS ORIGINAL ALIGNMENT. LENGTH OF BY-PASS CHANNEL NEEDED WILL VARY AT EACH WORK AREA. CONTRACTOR SHALL DETERMINE THE LENGTH OF BY-PASS CHANNEL NEEDED FOR EACH WORK AREA.
- CONTRACTOR SHALL CONSTRUCT TEMPORARY FLOW DIVERSION MEASURES STARTING AT UPSTREAM END OF WORK AREA TO DIRECT WATER AWAY FROM WORK AREA. LENGTH OF FLOW DIVERSION MEASURES NEEDED WILL VARY AT EACH WORK AREA. CONTRACTOR SHALL DETERMINE THE LENGTH OF FLOW DIVERSION MEASURES NEEDED FOR EACH WORK AREA.
- CONSTRUCTION WITHIN THE ISOLATED WORK AREA MAY NOT COMMENCE UNTIL THE OWNER HAS COMPLETED ALL FISH EXCLUSION ACTIVITIES. ALL TEMPORARY FISH EXCLUSION NETS INSTALLED BY THE OWNER MUST REMAIN IN PLACE DURING REMOVAL OF FLOW DIVERSION AND OTHER TESC MEASURES. THE OWNER SHALL BE RESPONSIBLE FOR REMOVING FISH EXCLUSION NETS.
- GROUND WATER ENCOUNTERED DURING ELJ EXCAVATIONS MAY BE PUMPED AS NECESSARY TO INFILTRATION AREAS TO ALLOW CONSTRUCTION AND INSPECTION OF ELJ STRUCTURES, AND TO FACILITATE THE REMOVAL OF SEDIMENT AND TURBIDITY FROM THE WATER. INFILTRATION AREAS ARE NOT SHOWN ON THE PLANS. ALL INFILTRATION AREAS PROPOSED BY THE CONTRACTOR SHALL BE APPROVED BY THE ENGINEER OR OWNER BEFORE THEIR USE. ANY DISCHARGE OF WATER RETURNING TO THE RIVER (DUE TO DEWATERING ACTIVITIES) SHALL NOT EXCEED THE WATER QUALITY REQUIREMENTS SET FORTH IN THE PROJECT PERMITS.
- GROUND WATER MAY BE PUMPED TO INFILTRATION AREAS AND DISCHARGED THROUGH AN ENERGY DISSIPATOR, LEVEL SPREADER, SILT BAGS, OR APPROVED OTHER AS APPROVED BY THE ENGINEER. WATER DISCHARGED OR INFILTRATED SHALL NOT CAUSE EROSION OR RESULT IN TURBIDITY IMPACTS TO THE RIVER.
- GROUND WATER MAY NOT BE PUMPED DIRECTLY TO WETLANDS OR NEW OR EXISTING CHANNELS WITHOUT PRIOR APPROVAL FROM THE ENGINEER. WATER SHALL BE DISCHARGED IN ACCORDANCE WITH THE PLANS, SPECIFICATIONS AND PERMITS
- THE ENGINEER SHALL BE NOTIFIED 24 HOURS IN ADVANCE OF ANY WATER PUMPING ACTIVITIES.
- CONSTRUCTION DEWATERING SHALL BE MAINTAINED 24 HOURS PER DAY DURING CONSTRUCTION AND MONITORED BY THE CONTRACTOR DURING NON-WORKING HOURS.

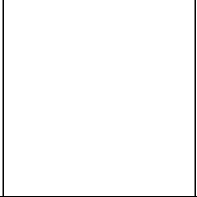
SHORING NOTES:

- CONTRACTOR SHALL DESIGN ALL REQUIRED SHORING AND ALL FLOW AND WATER EXCLUSION STRUCTURES AND SYSTEMS. HYDROSTATIC PRESSURES SHALL BE ADDED TO LATERAL PRESSURES DUE TO EARTH, SURCHARGES AND SPECIAL PRESSURES. SPECIAL PRESSURES MAY INCLUDE BUT ARE NOT LIMITED TO HYDROSTATIC PRESSURES RESULTING FROM BACKWATER CONDITIONS, TEMPORARY SHORING SEEPAGE, MACHINERY SURCHARGE AND FLUCTUATING GROUNDWATER.
- OTHER SURCHARGES SHALL BE DETERMINED BY THE CONTRACTOR ON THE BASIS OF CONSTRUCTION TRAFFIC, EQUIPMENT STORAGE, SPOILS HANDLING, WORK SEQUENCE AND OTHER FACTORS.
- ALL TEMPORARY SHORING SYSTEMS SHALL BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER WITH A MINIMUM FACTOR OF SAFETY OF 1.4 (FS = 1.4).



PRELIMINARY DESIGN - NOT FOR CONSTRUCTION				
No.	REVISION	BY	APP'D	DATE

ONE INCH
↑
AT FULL SIZE, IF NOT ONE
INCH SCALE ACCORDINGLY



DESIGNED: B. SCOTT	DRAWN: E. MARSHALL
DESIGNED: I. MOSTRENKO	DRAWN: -
DESIGNED: -	CHECKED: I. MOSTRENKO
SCALE: AS NOTED	APPROVED: M. EWBANK

MASHIEL RIVER REACH 7 RESTORATION PROJECT SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP	
WATER MANAGEMENT NOTES AND WORK AREA ISOLATION	

DATE:	AUGUST 2016	
PROJECT NO:	15-06082-000	
DRAWING NO:	C-13	
SHEET NO:	15	OF 16

ORIGINATED BY: / DATE: /

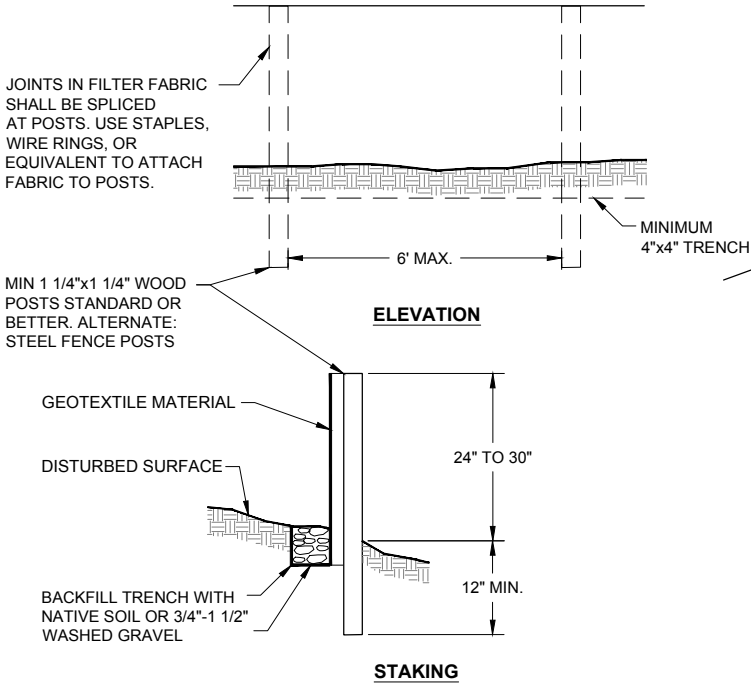
CHECKED BY: / DATE: /

BACK-CHECKED BY: / DATE: /

CORRECTED BY: / DATE: /

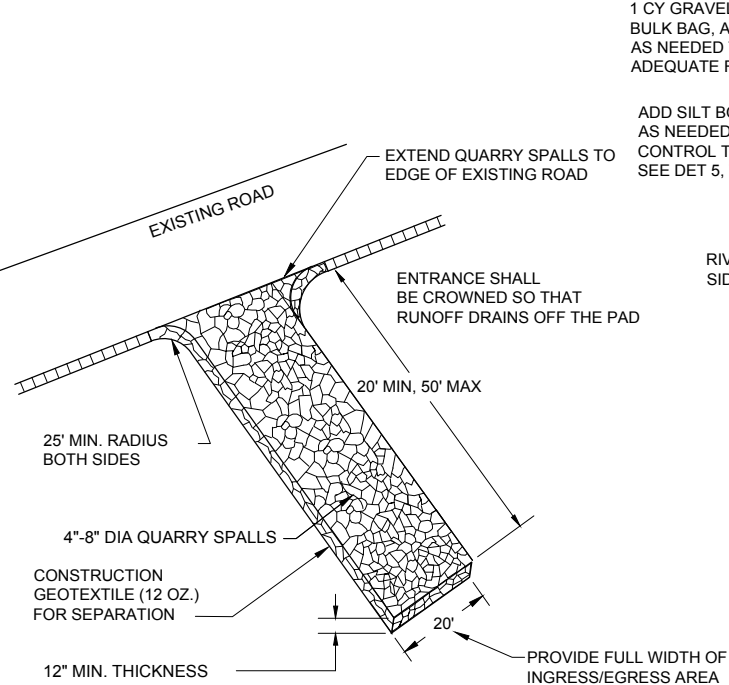
VERIFIED BY: / DATE: /

C:\pww\2016\15-06082-000\CADD\dwg\C-14.dwg | 8/19/2016 12:38 PM | Eric Marshall

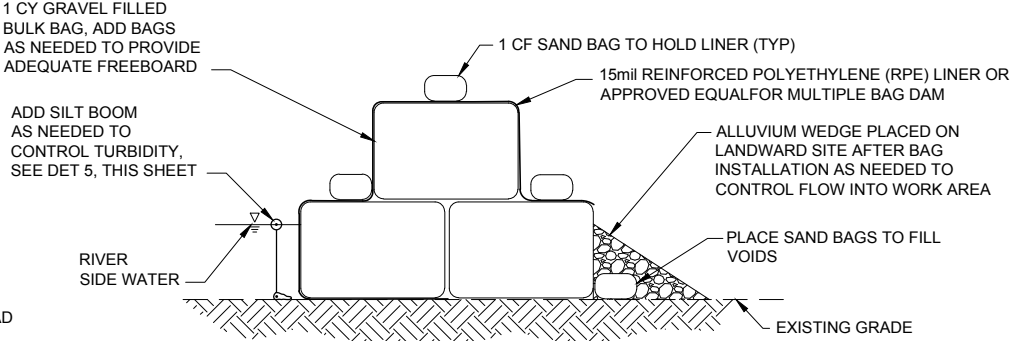


- SILT FENCE NOTES:**
- THE FILTER FABRIC (CONSTRUCTION GEOTEXTILE FOR TEMPORARY SILT FENCE) SHALL BE PURCHASED IN A CONTINUOUS ROLL, 5FT WIDE, CUT TO THE LENGTH OF THE BARRIER TO AVOID USE OF JOINTS. WHEN JOINTS ARE NECESSARY, THE FILTER FABRIC SHALL BE SPICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6 INCH OVERLAP, AND SECURELY FASTENED TO THE POST.
 - THE FENCE POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND A MINIMUM OF 12 INCHES.
 - A TRENCH SHALL BE EXCAVATED A MINIMUM OF 4 INCHES WIDE BY 4 INCHES DEEP, UPSLOPE AND ADJACENT TO THE POST TO ALLOW THE FILTER FABRIC TO BE BURIED.
 - THE FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE POSTS, AND 12 INCHES OF THE FABRIC SHALL BE EXTENDED INTO THE TRENCH. THE FABRIC SHALL NOT EXTEND MORE THAN 30 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO TREES.
 - THE TRENCH SHALL BE BACKFILLED WITH NATIVE SOIL OR WITH 3/4"-1 1/2" WASHED GRAVEL.
 - SILT FENCES SHALL BE REMOVED AT DIRECTION OF ENGINEER, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.
 - SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL EVENT AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
 - SILT FENCE PERFORMANCE SHALL BE EVALUATED AND SILT FENCE LOCATIONS SHALL BE EVALUATED AND ADJUSTED AS DIRECTED OR APPROVED BY THE ENGINEER AND THE PERMITTING AUTHORITY.
 - SILT FENCE SHALL BE INSTALLED AS SHOWN ON DRAWINGS.
 - ANY DEVIATION OR CHANGE TO SILT FENCE DETAILS MUST BE APPROVED BY ENGINEER.
 - THE CONTRACTOR SHALL MAINTAIN A COPY OF THE MANUFACTURER'S SPECIFICATIONS FOR FILTER FABRIC ON SITE.
 - MAINTENANCE STANDARDS:
 - ANY DAMAGE SHALL BE REPAIRED IMMEDIATELY.
 - IF CONCENTRATED FLOWS ARE EVIDENT UPHILL OF THE SILT FENCE, THEY MUST BE INTERCEPTED AND CONVEYED TO A SEDIMENT TRAP OR POND, OR OTHERWISE DIVERTED TO A LOCATION THAT DOES NOT RESULT IN TURBID DISCHARGES TO SURFACE WATERS.
 - THE UPHILL SIDE OF THE SILT FENCE SHALL BE CHECKED FOR SIGNS OF THE SILT FENCE CLOGGING, ACTING AS A BARRIER TO FLOW, AND CAUSING CHANNELIZATION OF FLOWS PARALLEL TO THE FENCE. IF SUCH CHANNELIZATION OCCURS, THE CONTRACTOR SHALL REPLACE THE FENCE OR REMOVE THE TRAPPED SEDIMENT.
 - SEDIMENT SHALL BE REMOVED AND PROPERLY DISPOSED OF WHEN THE SEDIMENT IS 6 INCHES HIGH.
 - IF THE FILTER FABRIC HAS DETERIORATED DUE TO ULTRAVIOLET BREAKDOWN, IT SHALL BE REPLACED.

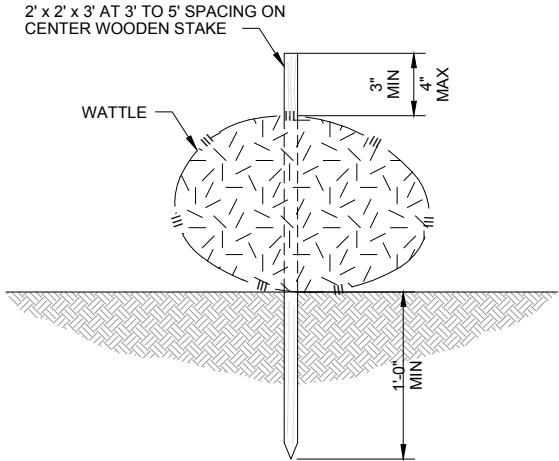
DETAIL - SILT FENCE 1
SCALE: NTS



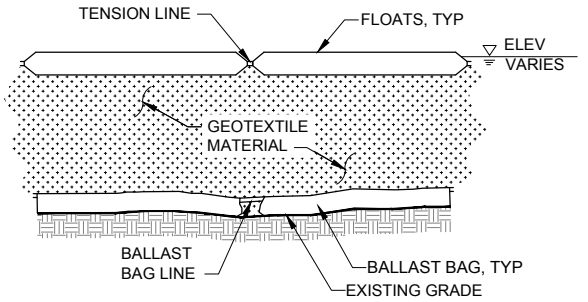
DETAIL - STABILIZED CONSTRUCTION ENTRANCE 2
SCALE: NTS



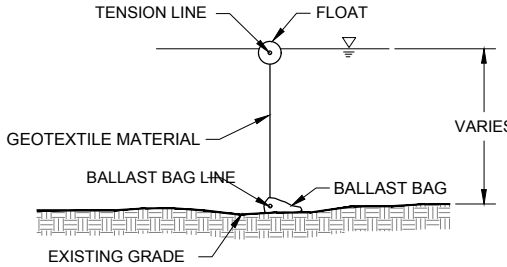
DETAIL - TYPICAL BULK BAG ISOLATION DAM 3
SCALE: NTS



DETAIL - WATTLE 4
SCALE: NTS



ELEVATION



DETAIL - SILT BOOM 5
SCALE: NTS

EROSION AND SEDIMENT CONTROL NOTES:

- APPROVAL OF THE CONTRACTOR'S TEMPORARY WATER AND SEDIMENT CONTROL PLAN DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G., SIZE AND LOCATION OF ROADS, PIPES, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES, ETC.)
- THE IMPLEMENTATION OF EROSION AND SEDIMENT CONTROL (ESC) PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS APPROVED.
- THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED PRIOR TO OR IN CONJUNCTION WITH ALL CLEARING AND GRADING SO AS TO ENSURE THAT THE TRANSPORT OF SEDIMENT TO SURFACE WATERS, DRAINAGE SYSTEMS, AND ADJACENT PROPERTIES IS MINIMIZED.
- THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND MODIFIED TO ACCOUNT FOR CHANGING SITE CONDITIONS (E.G., ADDITIONAL SUMP PUMPS, RELOCATION OF DITCHES AND SILT FENCES, ETC.).
- THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR'S ESC SUPERVISOR AND MAINTAINED AS NECESSARY.
- ANY AREAS OF EXPOSED SOILS THAT WILL NOT BE DISTURBED FOR SEVEN DAYS SHALL BE IMMEDIATELY STABILIZED WITH ESC METHODS (E.G., SEEDING, MULCHING, PLASTIC COVERING, ETC.)
- ANY AREA NEEDING ESC MEASURES THAT DO NOT REQUIRE IMMEDIATE ATTENTION SHALL BE ADDRESSED WITHIN SEVEN (7) DAYS.
- THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED WITHIN TWENTY FOUR (24) HOURS FOLLOWING A STORM EVENT.
- STABILIZED CONSTRUCTION ENTRANCES AND ROADS SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES, SUCH AS WASH PADS, MAY BE REQUIRED TO ENSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
- WHERE STRAW MULCH FOR TEMPORARY EROSION CONTROL IS REQUIRED, IT SHALL BE APPLIED AT A MINIMUM THICKNESS OF 2 TO 3 INCHES.
- AT COMPLETION OF CONSTRUCTION, CONTRACTOR SHALL BACKBLADE TO MATCH EXISTING GRADE AND REPAIR SOFT SPOTS BY REPLACING SUITABLE NATIVE MATERIAL.
- WRITTEN RECORDS SHALL BE KEPT OF WEEKLY REVIEWS OF THE ESC FACILITIES.

PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

No.	REVISION	BY	APP'D	DATE

ONE INCH
↑
AT FULL SIZE IF NOT ONE
INCH SCALE ACCORDINGLY
↓

Know what's below.
Call before you dig.

DESIGNED: B. SCOTT	DRAWN: E. MARSHALL
DESIGNED: I. MOSTRENKO	DRAWN: -
DESIGNED: -	CHECKED: I. MOSTRENKO
SCALE: AS NOTED	APPROVED: M. EWBANK

MASHEL RIVER
REACH 7 RESTORATION PROJECT
SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP

TESC DETAILS

DATE:
AUGUST 2016

PROJECT NO:
15-06082-000

DRAWING NO:
C-14

SHEET NO:
16

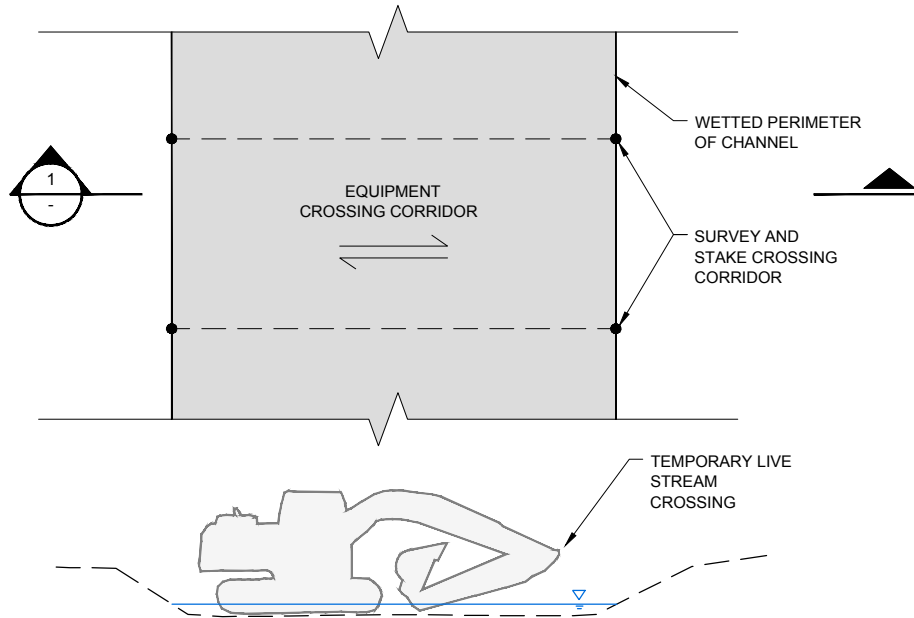
OF
16

ORIGINATED BY: / DATE: /

CHECKED BY: / DATE: /

BACK-CHECKED BY: / DATE: /

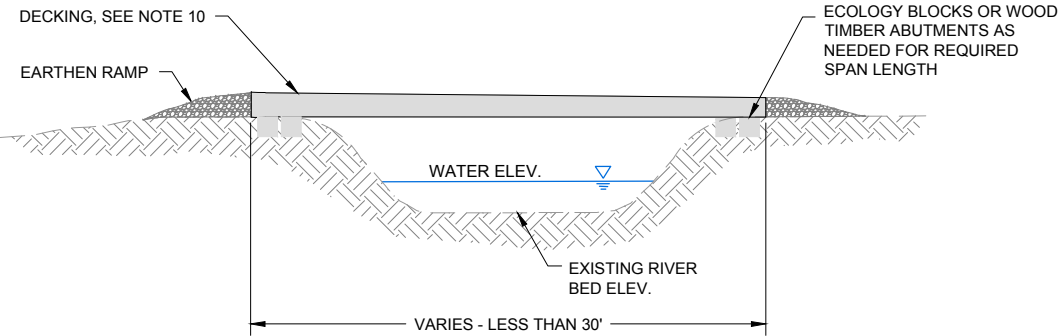
C:\pww\2016\15-06082-000\CADD\dwg\c-15.dwg | 8/19/2016 12:38 PM | Eric Marshall



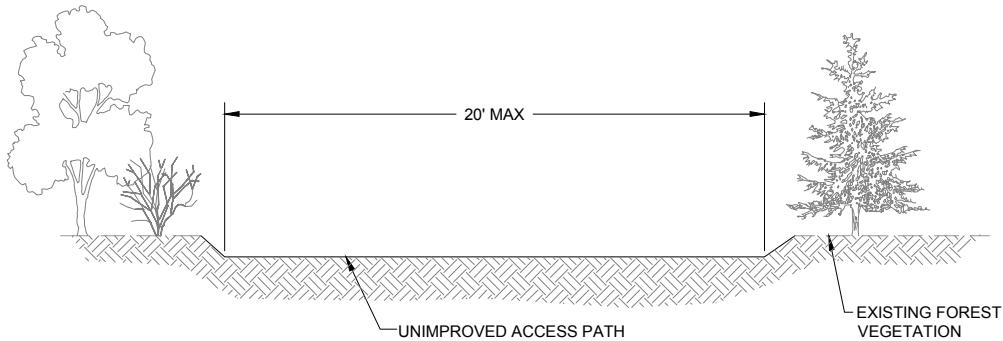
DETAIL - TEMPORARY LIVE STREAM CROSSING
SCALE: NTS

TEMPORARY LIVE STREAM CROSSINGS NOTES:

- ONLY LIMITED LIVE STREAM CROSSINGS (WITHOUT A TEMPORARY BRIDGE) FOR EQUIPMENT ACCESS SHALL BE ALLOWED AS REQUIRED TO CONSTRUCT TEMPORARY BRIDGES, TO ISOLATE THE ELJ WORK AREAS, OR TO CONSTRUCT ELJS. MAXIMUM NUMBER OF DAILY LIVE STREAM CROSSINGS ALLOWED AT EACH CROSSING LOCATION SHOWN ON THE SITE PLANS SHALL BE UP TO 2 TIMES, UNLESS OTHERWISE NOTED ON THE CONTRACT PLANS OR IN THE PROJECT HPA PERMIT.
- UNDER NO CIRCUMSTANCES MAY THE LIVE STREAM CROSSING INCLUDE PLACING FILL INTO THE CHANNEL OR ESTABLISHING A FORD THROUGH THE WATER FOR ACCESS OR VEHICULAR TRAFFIC, UNLESS THE ACCESS IS REQUIRED TO CONSTRUCT TEMPORARY BRIDGES, TO ISOLATE THE ELJ WORK AREAS, TO CONSTRUCT THE ELJS, OR UNLESS OTHERWISE NOTED ON THE CONTRACT PLANS OR IN THE PROJECT HPA PERMIT.
- CONTRACTOR SHALL INSTALL A TEMPORARY BRIDGE FOR WORK AREAS REQUIRING MORE THAN 2 DAILY LIVE STREAM CROSSINGS TO PREVENT EQUIPMENT FROM COMPACTING THE CHANNEL BED SUBSTRATE.
- COORDINATE CROSSING LOCATION WITH ENGINEER TO MINIMIZE IMPACTS TO FISH HABITAT, SPAWNING NESTS (REDDs), COMPACTION OF SUBSTRATE AND DISTURBANCE TO VEGETATION.



DETAIL - TYPE I TEMPORARY BRIDGE
SCALE: NTS



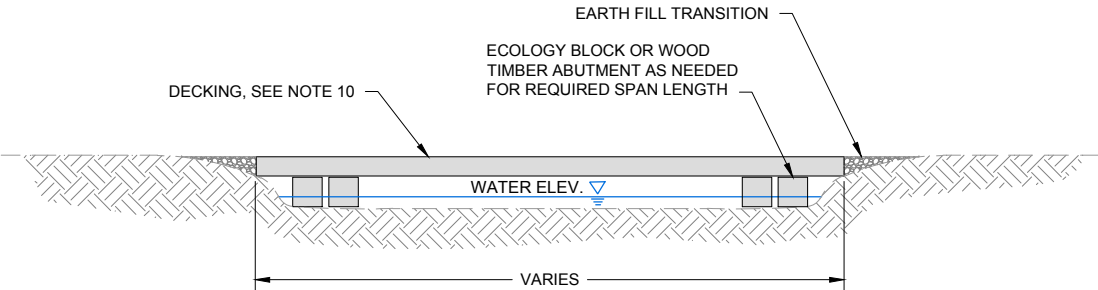
DETAIL - TEMPORARY ACCESS PATH
SCALE: NTS

TEMPORARY ACCESS PATH NOTES:

- CLEARED ACCESS PATH TO BE ALIGNED TO MINIMIZE VEGETATION DISTURBANCE AND FOREST CLEARING.
- CONTRACTOR SHALL MARK CLEARING LIMITS WITH FLAGGING. CLEARING LIMITS TO BE APPROVED BY ENGINEER PRIOR TO ANY CLEARING ACTIVITIES.
- NO STANDING TREES GREATER THAN 4 INCHES DIAMETER AT BREAST HEIGHT (DBH) SHALL BE REMOVED WITHOUT THE APPROVAL OF THE ENGINEER.
- ANY TREES GREATER THAN 4" DBH SHALL BE REMOVED W/ ROOTWADS INTACT AND STOCKPILED FOR USE IN ELJ CONSTRUCTION, OR AS ROUGHENING ALONG ACCESS PATHS FOLLOWING ELJ CONSTRUCTION AND DURING ACCESS PATH DECOMPACTION AND RESTORATION.
- ALL OTHER TREES AND SHRUBS REMOVED SHALL BE STOCKPILED FOR USE AS SLASH AND RACKING IN ELJ CONSTRUCTION, OR AS ROUGHENING ALONG ACCESS PATHS FOLLOWING ELJ CONSTRUCTION AND DURING ACCESS PATH DECOMPACTION AND RESTORATION.
- CLEARED ACCESS PATH SHALL BE DECOMPACTED VIA DISCING OR RIPPING AT THE TERMINATION OF WORK TO A MINIMUM DEPTH OF 1 FOOT ACROSS THE ENTIRE WIDTH OF THE CLEARED PATH.
- SOIL REMOVED AS PART OF ACCESS ROAD CONSTRUCTION SHALL BE STOCKPILED AND THEN SPREAD BACK ONTO TEMPORARY ACCESS ROAD ALIGNMENT FOLLOWING COMPLETION OF WORK. EXISTING GRADE OF ACCESS ROAD SHALL BE RESTORED AS PART OF WORK TO REMOVE ACCESS ROAD.
- ACCESS ROAD SHALL BE MAINTAINED BY MINOR GRADING AND IMPORTATION OF HOG FUEL, BARK OR WOOD CHIPS AS NECESSARY, OR AS DIRECTED BY THE ENGINEER PER SPEC. SECTION 9-14.4(3). GRAVEL OR QUARRY SPALLS ARE NOT ALLOWED TO BE PLACED ON TEMPORARY ACCESS ROADS.

TEMPORARY BRIDGES NOTES:

- ALL TEMPORARY BRIDGES SHALL BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER WITH A MINIMUM FS = 1.4.
- TYPE I TEMPORARY BRIDGES SHALL BE USED TO CROSS DEEP CHANNELS WITH HIGH, NEARLY VERTICAL BANKS.
- TYPE II TEMPORARY BRIDGES SHALL BE USED TO CROSS A SHALLOWER CHANNEL CROSS-SECTION WITH LOW SLOPING BANKS.
- TEMPORARY BRIDGES SHALL BE LOCATED SUCH THAT THEY REQUIRE ONLY ONE SPAN TO AVOID IMPACTS TO SUBSTRATE OF CHANNELS.
- ENDS OF TYPE I BRIDGE SHALL BEAR ON HIGH BANKS WITH SUFFICIENT BEARING CAPACITY TO PREVENT SLOUGHING OR COLLAPSE OF CHANNEL BANKS.
- ENDS OF TYPE II BRIDGE SHALL BEAR DIRECTLY ONTO EXISTING GROUND.
- TYPE II BRIDGES MAY OFTEN BE CONSTRUCTED BY PLACING TEMPORARY ABUTMENT SUPPORTS INTO THE CHANNEL AS SHOWN.
- CONSTRUCTION AND REMOVAL OF BRIDGES WILL LIKELY ENTAIL EQUIPMENT CROSSING THE WETTED CHANNEL TO PLACE AND REMOVE ABUTMENTS.
- CONCRETE ECOLOGY BLOCKS OR WOOD ABUTMENTS MAY BE USED TO SUPPORT ENDS OF TEMPORARY BRIDGE AS NEEDED.
- BRIDGES MAY BE CONSTRUCTED FROM LOGS, RAIL CAR BEDS OR APPROVED EQUAL AND DECKED WITH STEEL SHEETING, WOOD LAGGING, OR APPROVED EQUAL.
- TEMPORARY BRIDGES MAY BE CONSTRUCTED TO SERVE AS WORK PLATFORMS IF NECESSARY TO CONSTRUCT THE ELJS.



DETAIL - TYPE II TEMPORARY BRIDGE
SCALE: NTS

PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

No.	REVISION	BY	APP'D	DATE

ONE INCH
↑
AT FULL SIZE, IF NOT ONE
INCH SCALE ACCORDINGLY



DESIGNED: B. SCOTT	DRAWN: E. MARSHALL
DESIGNED: I. MOSTRENKO	DRAWN: -
DESIGNED: -	CHECKED: I. MOSTRENKO
SCALE: AS NOTED	APPROVED: M. EWBANK

MASHEL RIVER REACH 7 RESTORATION PROJECT SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP
WATER CROSSING DETAILS

DATE:	
AUGUST 2016	
PROJECT NO:	
15-06082-000	
DRAWING NO:	
C-15	
SHEET NO:	OF
17	16